WORKING MAN'S COMPANION.

THE PHYSICIAN:

(I. THE CHOLERA.)



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I. THE CHOLERA.

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THE

WORKING-MAN'S COMPANION.

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I. THE CHOLERA.

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THE

PHYSICIAN.

NOTICE.

The Society has for some time had it in contemplation to publish, in a cheap form, under the title of '*The Physician*,' such plain and useful information relating to Medicine as may be serviceable to the working-classes of readers, who, together with too many of the higher classes, are the objects of delusion from pretenders to a knowledge of the art of healing; and, in the course of their ordinary occupations, incur many inconveniences, and often much suffering and loss, from which a little knowledge of the nature of different diseases would tend to protect them.

The extreme interest attached at the present moment to a disease which, after spreading over almost every degree of latitude, has actually appeared in the north of England, has made it desirable to devote a considerable portion of the present volume to the description and history of Cholera, and to plain directions for avoiding it. The use of such directions will not be confined, however, to

Cholera alone, as they will necessarily comprehend observations connected with the preservation of the general health of working-men.

To render even this subject at all intelligible, and to show that the advice given to the working-man regarding his health is founded in reason, it is necessary to begin with a view —of course, a very brief view—of the structure and functions of the principal parts of the human frame. Such a prefatory explanation being essential to the comprehension of the causes and symptoms of maladies, forms also an appropriate introduction to the whole of the proposed work.

In future volumes of 'The Physician,' it is designed to treat more particularly, but with as much plainness as possible, of the structure and actions of different regions of the body,—as of the organs contained in the chest, in the abdomen, in the head,—and to describe the nature, the usual causes, and the general principles of the treatment of the diseases or accidents most frequently affecting each. The maladies occasioned by different occupations and trades may be usefully introduced into this plan; for there is much reason to believe that the unwillingness with which workmen have availed themselves of the several contrivances intended for their protection when engaged in work destructive to health, has sometimes arisen from their not clearly understanding in what manner the hurtful agent to which they were exposed produced its bad effects upon them.

Unlike the common books of popular medicine, so eagerly purchased by the poorer as well as richer classes of readers, this publication is not meant to supersede an application of the sick to persons competent to cure them, but to show them that it is only in such persons that they can safely trust. It is as far from the intention of 'The Physician' to encourage an incautious use of medicines. By showing the tendency of different circumstances or things to produce disease, and by explaining the nature of the diseases thus excited, and the manner in which remedies are intended and may be expected to act, it is meant to produce greater caution in incurring the calamity of sickness, and more prompt application to skilful men, instead of reliance on ignorant and unprincipled persons, who, with fraudulent promises and impudent pretensions, gain the patronage of the rich, and often contrive to obtain a large share of the honest earnings of the poor and uneducated, leaving them at last with empty pockets and a ruined constitution.

INTRODUCTION.

Thoroughly to understand the nature and treatment of any malady whatever, requires a previous and an exact acquaintance with the sciences of Anatomy and Physiology, which describe the structure and the actions or functions of the human body. The structure and functions of all the parts have so mutual a dependence, and so many connexions, that no part can be studied entirely separate from the rest. But a very useful degree of knowledge, both of anatomy and physiology, may be acquired by any one who is able to read, and who possesses ordinary powers of observation; and it is to be regretted that so few persons of liberal education, or so few who are fond of something more than light reading, comprehend these sciences in their plan of reading and study; and that there is, as an almost necessary consequence, so little accurate popular knowledge diffused concerning them. Enough might be learnt, without great trouble, to enable any one to form a tolerably clear conception of the character of many of the most common disorders; and this kind of knowledge, whilst it would protect the public from the frauds of quackery, would also abolish many hurtful customs and habits, and substitute others for them more conducive to

the public health. It would prevent the foolish fears which are every now and then observed to be needlessly excited in the public mind; and, at the same time, show where real danger was to be expected, and how it was to be provided against.

Most people of ordinary curiosity have seen a human skeleton. Connected in the mind, from an early age, with ideas and images of death, the eye of the unprofessional spectator is perhaps turned away from it with a feeling approaching to fear; or, reflecting that such is all that remains of beauty or activity, with a painful sense of degradation. But whoever will give ten minutes to a closer examination of it, in the company of one acquainted with its structure, will find these unpleasant feelings give place to curiosity and to admiration. At once extremely solid and extremely light, the separate bones are seen to be contrived both for strength and for motion. The manner in which the separate bones are united by joints or otherwise, is as curious as anything in mechanics; and the structure of the arm and hand, and of the leg and foot, is singularly delicate, and even beautiful.

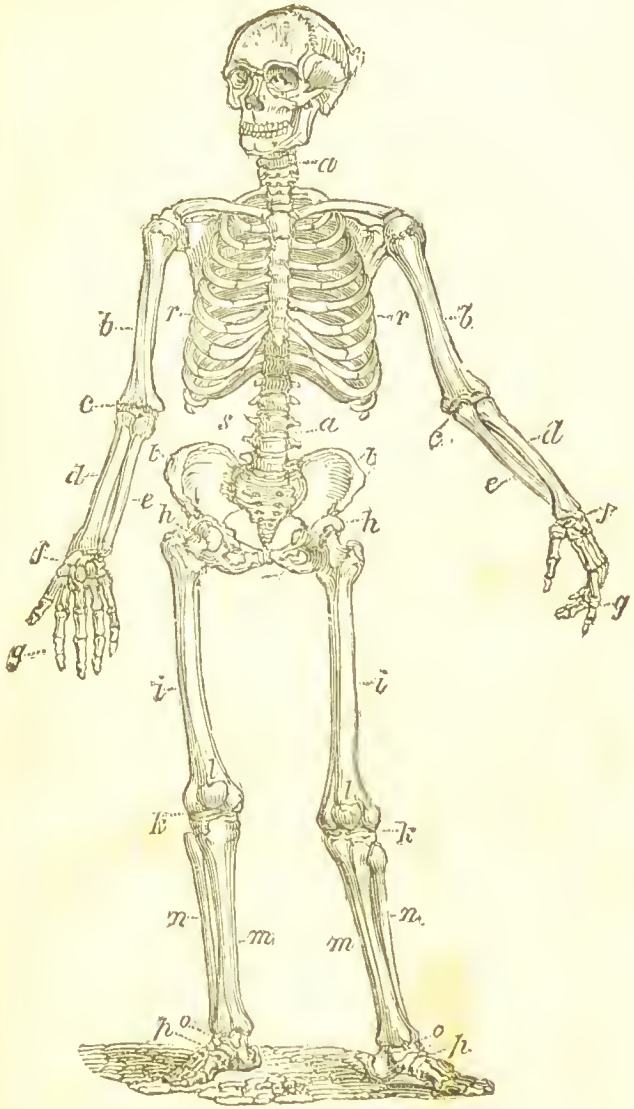
One reflection, in particular, seems very obviously to arise from a first survey of the skeleton. It cannot but be matter of some astonishment, that so many hard bones of such various shapes,—round bones and long, thick bones, and bones like a shell, with all their points, angles, and joinings,—can ever be set in motion without great effort, without pain,

and even without noise. We, who contemplate the skeleton, have within us the same bony supports, the same frame-work, the same scaffolding; yet we move without the least jar or disturbance; we walk, we run, we dance; the bones do not rattle or strike together, even in the leaps and contortions of a tumbler. The arm swings round, and the body bounds upon the feet, and all without noise or shock. This effect, so curious as well to deserve notice, although so common that its notice seems almost ridiculous, is produced by soft substances introduced between the ends, or at the joints of those bones which are not firmly attached to each other. Wherever there is a joint, there is this cushion prepared in some shape or other; and the cushion is elastic or springy, and kept continually moist. It no less exists at the joints of the fingers and toes than at those of the shoulder and thigh. Nowhere is it more beautifully seen than between the bones of the spine, of which, indeed, the separate bones, twenty-four in number, with the various muscles which move them, the various bending and turning movements they produce, and the complete security from injury either of the bones themselves or of the very important part they contain, namely, the spinal marrow, in all common, and in many uncommon movements, present an especial subject of wonder. There never was a machine invented answering so many useful ends, and performing so many actions, with so little wear and tear.

Yet this is only one part of the skeleton. Examine the bones of the arm and hand, and you find a long and very firm bone extending from the shoulder to the elbow, resting its round head in so shallow a socket, for the purpose of performing wide and free motions, that if it were not tied down by the strong muscles which move it, together with all the weights ever grasped by the hand, it would always be slipping out of place. The bone is round, or *cylindrical*, in shape, or nearly so, and has the strength of an arch. At the elbow you see another joint, quite different from that at the shoulder, and exactly like a hinge; not permitting such wide motion, but very free motion in one direction only. When this free motion is exerted, the fore-arm and hand are raised, and the muscle which raises them may be felt to swell almost like a ball, on the fore part of the arm, between the elbow and the shoulder. Two long bones extend from the elbow to the wrist, one from the hinge, and the other, which allows the twisting or rotating of the fore-arm and hand, somewhat loosely tied to the side of it. At the wrist you find a curious collection of small bones, eight in number, like so many pebbles, compactly tied together; and these little bones compose the wrist-joint. Down to the very ends of the fingers you find joints permitting all the motions which are wanted: and the little bones of the wrist, the hand, and the fingers, with those of the fore-arm and arm, moved by contrivances presently to be men-

tioned, contribute very much to give man superiority and dominion over animals, and enable him to accomplish many of his best performances, and to preserve his existence where animals without hands would die in helplessness.

The bones of the thigh, the leg, the ancle, and the foot, are equally deserving of notice. You find the ball or head of the thigh-bone in a deeper socket than that in which the head of the shoulder-bone rests; and the motion at this joint is well known to be more confined: but then the strength of the joint is much greater, for the whole weight of the body and head is collected on the thigh-joints, and moved upon them when we walk. Then there is the long cylindrical thigh-bone; the joint or hinge of the knee,—not so close a hinge as the elbow, but carefully tied and guarded by ligaments or strong bands, and protected in part by a little patch of bone, touching no other bone, and called the knee-pan, or *patella*. Below the knee you find two bones something like the two bones of the fore-arm; at the ancle you see one of them riding on an arch of bones beginning with the round heel bone. How all these parts are used in the exercises of leaping, running, dancing, or even in ordinary walking, it is needless to remind you. How the leg is advanced, how the feet are bent and turned, and how the balance of the body is maintained on so narrow a foundation, is only to be understood by looking at the machinery by which the movements of the bones are effected.



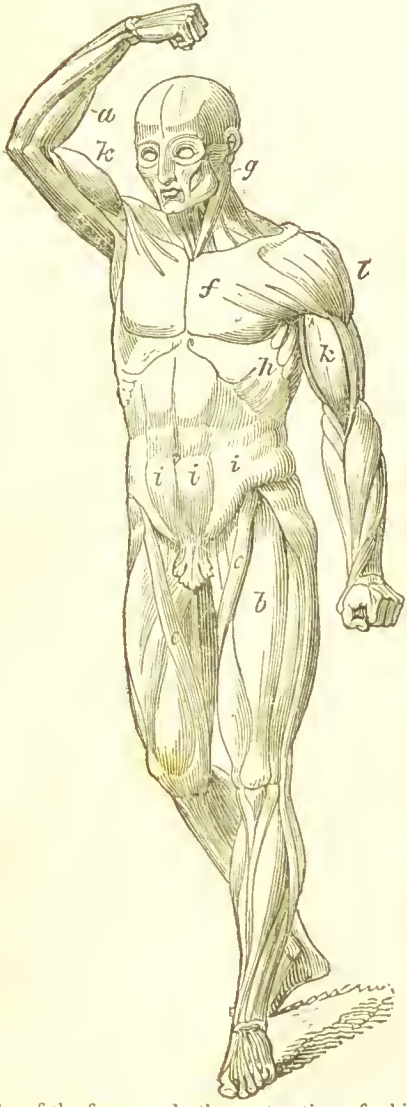
a, *a*. The spine, or back-bone.
b, *b*. The upper arm.
c, *c*. The elbow-joint.
d c, *d c*. The lower-arm.
f, *f*. Joint of the wrist.
g, *g*. Fingers.
h, *h*. Ball and socket-joint of the thigh.
i, *i*. The thigh.
k, *k*. The knee-joint.
l, *l*. The knee-pan, or patella.
m n, *m n*. The leg.
o, *o*. The ancle.
p, *p*. The foot.

A remarkable part of the human anatomy, generally quite unknown to those who do not study to qualify themselves for medicine or surgery, is that which serves to cover up and to move these firm and supporting bones: comprehending what are called the *muscles* of the human body. These are partly composed of what is commonly called flesh, and partly of a strong, white, shining substance, called tendon. Most of them are tendinous at one extremity, and the tendons of some are very long and slender, and yet possessed of great strength. If one arm, the left for instance, is grasped by the hand of the other, midway between the wrist and elbow, and then the fingers of the left hand are moved, the fleshy portion or fibres of the muscles situated in the left arm are felt to move or to contract, and they may be seen to draw up their long tendinous extremities in the wrist: these tendinous parts are bound down at the wrist, and pass on to the very extremity of the fingers, to move them. Everybody has noticed the tendons which move the toes of a bird,—white and strong strings, by pulling which the claws are made to bend:—in the living bird these tendons, which have now been divided, were moved by the contraction of the thick and fleshy part of the bird's leg above them; the contraction of such part answering to the pulling of the hand at the tendons of the dead bird's foot. Some of the muscles of the arm, shoulder, and thigh may be very distinctly seen throughout almost their whole extent.

Along the front of the thigh there is, for instance, a long and well defined muscle, called the rectus, or straight muscle, broader at its upper part, and gradually narrowing down into a tendon which ends at the knee: this muscle may be seen to act when the leg and foot are stretched forwards. A curious muscle may be seen also in the thigh of those who are not very fat, crossing over like a ribbon from the outside of the thigh to the inside of the knee: as this is the muscle which is brought into action when we sit down cross-legged, it is called the *sartorius*, or tailor's muscle. What is called the 'calf of the leg' is chiefly made up of a broad and thick muscle which passes down and becomes tendinous, and is fixed into the back part of the heel: this muscle is in full action when we rise on the toes, and is very actively employed in dancing. The tendon at the end, bearing or pulling up, on these and many other occasions, the whole weight of the body, is sometimes snapped asunder. The tendon itself is called the tendon of Achilles, because the mother of that ancient hero held him, it is said, when an infant, by the heel, whilst she dipped him in water which was to render him invulnerable.

It would be impossible, without going much more into the description of the different muscles, to convey an idea of the great number that are employed in the simple act of walking. How rapidly they may be moved, and with what exactness, may be perceived by any one who takes the trouble to watch the

THE MUSCLES, *Fig.* I.



a. The muscles of the fore-arm, by the contraction of which the fingers are moved.
b. The *rectus*, or straight muscle of the thigh.
c. The *sartorius*, or tailor's muscle.
f, *g*. A muscle called the sterno-cleido-mastoid muscle, employed in turning the head.
h. Muscles which raise and depress the ribs in breathing.
i, *i*, *i*. Muscles which compress and guard the bowels, and assist the actions of breathing.
k, *k*. The *biceps* muscle, which raises the fore-arm and hand.
l, *l*. The *deltoid* muscle, which protects the shoulder, and is chiefly employed when the arm is raised upwards and outwards.

fingers of a person playing on a musical instrument, or engaged in many of the commonest occupations.

There are also muscles which move the head from one side to the other, muscles which raise it or enable us to hold up our heads, and muscles by which we nod. The nodding of sleepy people is merely the dropping of the head in consequence of certain muscles not continuing to hold it in its proper position. The long muscles at the side of the neck, passing up from the top of the sternum, or breast-bone, to behind the ear on each side, are very plainly seen; and it is these by which a graceful turn of the head is accomplished. Besides these, there are muscles which raise and depress the ribs or chest, and muscles which compress and guard the bowels; there are many muscles for the organs of speech, muscles to open and shut the eyes, and to move the eyes themselves, and various other muscles for various other offices. Those of the face are very numerous, and it is the employment of these, under the influence of the feelings and affections, which creates what we term *expression.* Whoever has diverted himself by watching a monkey, must have seen that in all low, cunning, and mean kinds of expression, that comical animal is almost man's superior:—the face of a horse or a dog is capable of expressing affection, particularly of affection for offspring; but it is in the human face alone that the affections acquire their fullest indication, and that the higher and nobler feel-

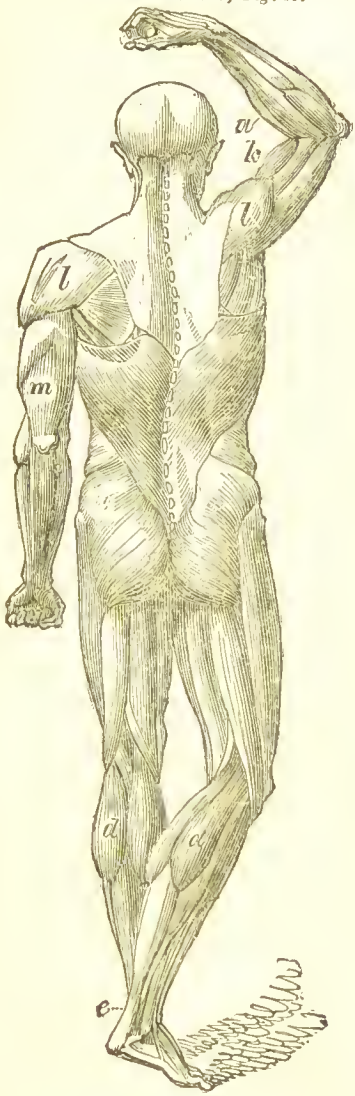
ings are depicted,—the external manifestation corresponding with the internal endowment.

The business of muscles being to contract, at the command of the will, or for effecting various purposes not generally directed by the will, any irregularity in their contractions, or any deficiency, or any excess of contraction, is attended with inconvenience. These irregularities may arise from various causes; and when we come to speak of the disease to which the greater part of this volume is devoted, the reader will be particularly reminded of this circumstance.

Looking again at the skeleton, we may observe that it is so formed as to contain, within different cavities, more or less perfect, many organs of the body. The closest, the strongest, and the most complete, is the cavity of the skull, made up of many bones, united in various and singular ways. This cavity is made to hold and guard the brain, by which it is completely filled. The several holes or perforations seen in the sides and lower part of the skull are for the passage inwards and outwards of blood-vessels and of nerves. There is a long canal all down the bones which form that very firm and yet very moveable column of many bones called the *spine:* within this canal is safely lodged the spinal marrow; it is connected at the upper part with the brain, and between the bones of the spinal column nerves pass out from it for various purposes.

The next cavity, not quite so closed and complete in the skeleton, but still very secure,

THE MUSCLES, *Fig.* II.



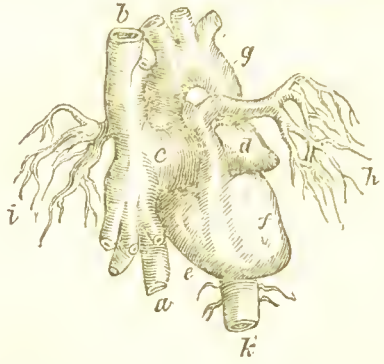
a. The same as in figure I.
d, d. The muscles called *gastrocnemii*, forming the calf of the leg.
e. The tendon of Achilles,
k. The same as in figure
l, l. The same as in figure I.
m. A muscle called the *triceps*, by the contraction of which the fore-arm is extended.

and made for motion as well as security, is that of the chest or thorax. Here are contained the lungs, which fill up the whole space except what is occupied on the left side of the chest by the heart. There is a sort of floor to the chest, by which it is divided from the part of the body called by anatomists the abdomen, comprehending all the trunk below the ribs. This floor is composed of a muscle which has somewhat the shape of an arch; it is called the diaphragm, and helps to contract and enlarge the chest in inspiration and expiration, that is, when we take in or breathe out air. It is the leaping or sudden contraction of this muscle which causes the troublesome sensation called *hiccup*.

The next and last cavity is the abdomen, still more imperfect as regards its bony walls, except at its upper and lower parts. Immediately under the diaphragm are placed, nearly in the centre, the stomach, on the right side the liver, and on the left side the spleen. Beneath these are arranged the long and intricate folds of the intestines; first, a very long tract of narrow intestines, and then a sudden enlargement, and a transverse intestine of greater size, crossing over from right to left. The narrow portion is called the small intestines; the wider is sometimes called the large, and is more particularly distinguished into the colon and the rectum. These parts of the body will also be particularly mentioned when we come to speak of the cholera.

Close to the spinal column, answering to the

part commonly called the loins, are placed the kidneys, one on each side. At the lowest part of the abdomen, protected by those solid bones which form what is called the *pelvis*, or bason, are the bladder, and in the female the womb.



Front View of the Heart and some of the large Blood-vessels.

a The vein which brings blood to the heart from the trunk and lower limbs, as well as from the stomach, liver, bowels, &c.
b The vein which brings blood to the heart from the head and upper extremities.
c The auricle on the right side of the heart.
d The auricle on the left side.
e The right ventricle.
f The left ventricle.
g The aorta, or great artery which carries the blood from the heart; it rises from the left ventricle.
h and *i*, The vessels by which blood is sent from the heart through the lungs on each side: they are seen to rise by one trunk from the right ventricle.
k The aorta, which, after forming an arch, is descending towards the stomach, &c.

The substance and structure of these organs is very various. The brain is in its interior of a white colour, in its exterior reddish or ashy; and there are curious folds and cavities within it. Its substance may perhaps not improperly be described as soft or *cheesy*. It is covered or wrapped up in three membranes, the outer one very firm. The lungs are soft, spongy, exceedingly light, and of a greyish blue colour. The heart is a very strong muscular organ, and has four cavi-

ties; two upper cavities, called auricles, and two lower cavities, called ventricles; an auricle and a ventricle on each side: in its interior there are valves and other arrangements for circulating the blood through these cavities.

The spleen is an organ not much firmer than the lungs, and of a dark blue or reddish colour. The liver is larger, and much firmer, of a reddish brown colour, and having at its lower part a small bladder, called the gall-bladder, for the accumulation of bile. There is a canal or duct from the liver into the upper part of the small intestines, for conveying bile, which has an important office to perform, connected with the perfect digestion of the food. The kidneys are also firm organs, and of a greyish pink colour. There is a canal from each into the bladder. Close behind the stomach, and lying very close to the spine, is a long, narrow, and pale gland, or collection, or congeries of glandular bodies, called the pancreas, or sweetbread; there is a duct from it into the upper part of the small intestines; and the fluid which is formed by the pancreas also contributes to digestion.

But the stomach, the small and large intestines, the bladder, and the uterus or womb, are entirely different from these. They are hollow organs, capable of distension and contraction, and their walls are partly formed of thin and firm materials, called membrane, and partly of a coat consisting of muscular fibres. The stomach and intestines have three coats,—an outer one, composed of what anatomists term

membrane, like a smooth, glossy, delicate, but firm skin, and called the *peritoneum;* a second, muscular, a coat of very delicate muscles; and an inner one, very smooth, called the mucous coat, a lining, in fact, like the lining of the mouth. Now it is to be kept in mind by the reader, that these coats are liable to disease, the inner one more especially; and that the muscles composing the muscular coat are subject, like other muscles, to fits of irregular action, or spasms.

In the living and healthy body, all the inequalities of these bodies, and all the actions going on in them, and all the fluids moving through them, are concealed from sight by the covering of the body, which is so contrived as, without tension, to produce smoothness, and, without being rugged, still to afford very secure protection from ordinary accidents. The outer surface of the general covering of the body is composed of *cuticle*, a substance without vessels or nerves, a mere production for a kind of shield, like the nails, perpetually wearing and renewed like them, and falling off like them after death. Under this is the *true skin*, much thicker, very full of vessels and nerves, and performing important offices. There is, it is to be remembered, a great sympathy between the skin and some of the internal organs,—as the lungs and the intestines,—so that one is seldom affected without the other. Below the skin is a soft substance, called, from its structure, cellular, which fills up hollows, and conduces much to soften the unsightliness

of muscles: this is what we see clinging to the inside of an animal's skin, when the skin is removed by the butcher; who sometimes blows air into its cells to improve the appearance of the meat.

In the dark races of mankind, the skin is covered with a kind of web or coat (*rete mucosum*), which is the seat of colour, and lies just under the cuticle. It is considered to exist, but is not so conspicuous, in the white races also.

It is not easy to give a brief and yet a clear account of the functions performed by all these organs. The attempt lays a writer open to the charge of trying to make a royal road to knowledge. Yet something may be done for the instruction of those who have not time to study the subject more at large. The difficulty is, in such a chain of associated functions, each contributing something to the other, all forming parts of one living whole, to know where to begin.

All the parts which have been alluded to, even the hard bones themselves, are supplied with blood-vessels, or long, flexible, elastic, membranous canals, which take blood from the heart for the supply of the different organs, and to furnish the materials for their continual nourishment, and for all the substances created, or, as it is termed, secreted in them—as bile in the liver; and with another set of vessels, which take the altered blood back to the heart; thus performing what is called the circulation of the blood. The vessels which carry blood *from* the heart

are called arteries; those which carry it *back* to the heart are called veins. The blood which is carried back by the veins is received into the auricle on the right side of the heart, from thence it is passed into the ventricle of the same side; from the ventricle it is driven through the lungs, where, by the air received at the same time by inspiration, it is changed from venous blood, of a dark colour, and unfit for the purposes of general supply, into arterial blood, of a florid colour, and fit to be circulated again. The blood is well known to be *warm*. Wherever blood flows freely, there is warmth; whenever it flows slowly, there is less warmth. This warmth, or animal heat, is supposed partly to depend on the nerves, and partly on what takes place in the lungs.

Very minute circumstances do not enter into the plan of this description, but there is a peculiarity worth observing in the circulation of the blood of the stomach, intestines, pancreas, and spleen; for the blood which is carried to these organs by their proper arteries does not return by direct veins, as from other parts, but is collected into a large vein, and carried by it to the liver, where the vein divides into many small branches, so as to circulate the blood which has already been to the stomach, intestines, pancreas, and spleen, through the liver also before it goes back to the heart. This is very curious, and will be seen to be important, as relates to some diseases.

In future volumes of 'The Physician' an attempt will be made to explain, without the

employment of many technical expressions, some parts of the process of circulation, respiration, and other functions of the body. In this preliminary sketch nothing more than the most general notice of them can be attempted.

When the blood has undergone the proper changes in the lungs, it is sent to the auricle on the left side of the heart, from thence into the left ventricle, and from thence through the aorta, or great artery, into the countless branches which supply all parts of the body. There is hardly any portion of the human body into which blood is not carried. The prick of a pin, or the slightest wound on the surface of the body, produces a drop of blood. The smaller vessels are so minute and numerous as to form a kind of universal network. By processes carried on in their fine and invisible extremities, the structure of every part of the body is kept perfect. The materials of every part are supplied to every part. Bone is deposited in bone; muscle in muscle; membrane in membrane: bile is formed in the liver; gastric juice in the stomach; milk in the female breast. If a part receives injury, these fine vessels conduct the work of repair, cause the adhesion of parts divided, or fill up, with an admirable masonry of fleshy granulations, a hollow wound, or conjoin and cement by new bony matter the fractured portions of the bones.

It is clear that all this borrowing from the blood must be made up again in some way. The supplies being so many, there must be some source of renewal. As the tree, which

from its sap renews all its parts, and puts forth leaves and fruit in season, is supplied through its roots from the never-failing earth, so is the constant exhaustion of the blood, in forming bone, muscle, and the various secretions, supplied by food exercised upon by the organs of digestion. But as man is not, like a plant, intended to grow and decay, to live and die, on one spot of ground, and cannot, like a plant, be supplied without exertion, he is endowed with the appetite of hunger, as well as with the means of moving about; and hunger, with other appetites and desires, keeps him in perpetual activity. The great variety of food in which he indulges is rendered suitable to him by the various arts of cookery, unnecessary and unknown to any of the lower animals. To seek food, to procure it, and to prepare it, constitute no small portion of the business of his existence. It is for this that he braves every climate, ventures upon and converts every eatable part of animals and vegetables to his use, tries every kingdom of nature in search of variety, and incurs or submits to every kind of labour, danger, and fatigue. The sense of exhaustion is insupportable, and to the call of hunger he can never, under any circumstances, be deaf.

When food is received into the stomach, the process of digestion is soon commenced; when the part of the process which the stomach performs is completed, the mass, now converted into what is called *chyme*, is passed into the commencement of the small intestines,

where, by the operation of bile received from the liver, and of other secretions, including a bland secretion from the pancreas, it is changed into *chyle*. As the chyle is slowly passed along the many windings of the small intestines, by the successive contraction of all the portions of them, throughout the whole of their folds, a space equal to many feet in length, it is taken up or absorbed by certain vessels which open into the intestines, called, from the colour of their contents, *lacteals* (from *lac*, milk), and by them carried into a larger vessel, called the *thoracic duct*, which runs up by the side of the spine as high as the neck, and there pours its contents, as a new supply, into the veins, which carrying it, mixed with the blood they contain, to the right side of the heart, it becomes, there and in the lungs, mingled more intimately with the blood, or rather converted entirely into blood, to be circulated through the arteries and veins with the rest.

This supply, it has been said, is intended to make up for the waste or expenditure of blood, incurred by the formation of various secretions, and by the renewal of all the structures of the body. In the body, as, indeed, throughout all the works of nature, nothing is at complete rest. Even the greatest and most solid masses of which the earth is composed are undergoing a slow but silent change. The waters of the ocean are continually yielding up vapours, and these, again, fall in rain and dew, and return by rivers to the sea. The seed becomes a plant, and the leaves and stem fall away when the fruit is

gathered, and mingle once more with the earth, to nourish other seeds. So, also, in the frame of man, the materials are ever changing, new parts forming, and old parts removed. For this removal there are several obvious provisions, and also a peculiar set of vessels, ramifying over every part of the body, called absorbents, which carry away, in a fluid state, those solid materials of the body that were at first formed and deposited from the circulating blood.

This slight survey of some of the functions of the body is sufficient to show how very important is the assistance given by the organs of respiration and of circulation to those of digestion and nutrition; and this may serve to illustrate that inseparable chain of connexion which was before alluded to.

There is, however, yet one very important part of the human body to be spoken of, which is commonly called the Nervous System. It comprehends the *brain*, (subdivided by anatomists into brain, cerebellum, or little brain, and medulla oblongata,) the *spinal marrow*, and all the *nerves*. The office of a large portion of the brain is to perform the working of the mind. Digestion is performed in the stomach; *thinking* is performed in the brain. Certain nerves, capable of receiving impressions from certain external objects, convey them to the brain. The fingers are supplied with nerves, which receive and convey the impressions of touch. The retina, an inner coat or lining of the eye, has a nerve expanded over it, or rather, is formed of nervous mat-

ter, which receives and transmits to the brain the sense of colours. By means of other nerves, the desires, or the will, which are formed in the brain, communicate their intentions to the muscles, and the muscles contract in obedience to the commands thus sent to them. These, however, form probably but a small part of the functions of the various parts of the brain, some of which may be more intimately concerned than they are yet known to be in the government of different kinds of motion, and of the circulation and secretion. The nerves of the body proceeding from the brain, and from the spinal marrow, which is connected with the brain, and another system of nerves in the interior of the body, sometimes called the sympathetic system, being connected with all the rest, are so very numerous, and so variously conjoined, that without drawings or preparations, which are to be seen in museums and in books of anatomy, no description of them could be understood. As every organ is supplied with blood-vessels, so also every organ is supplied with branches of nerves. How universally the surface of the body is supplied with nerves of *sensation* may be known by the pain that may everywhere be produced by slight causes.

We know that a connexion with the brain is necessary to the continued functions of the nerves by this, among other proofs, that if the connexion is severed, the function of the nerve ceases. We know that there are nerves for sensation, and nerves for motion; for we can

put an end to sensation, or to motion, at will, by dividing them. How sensation is effected —how transmitted to the brain—in what manner the will is formed—how its orders are conveyed along the nervous chords to the muscles; all this we know nothing about. But if we are ignorant how thought is carried on, we are no less ignorant how the action of the heart is kept up—how respiration produces the changes which we know it effects on the blood—or in what manner, from one material, the blood, so many materials are so continually produced in the body.

The chain of connexion already mentioned more than once, may here be mentioned again. Strong impressions, of various kinds, upon the nervous system will disturb the actions of the heart, and of all other muscles; will interrupt secretion, embarrass respiration, disorder digestion, and suspend nutrition. Thus fear or joy produce palpitation, or perhaps an hysteric fit: a sense of shame, or an indelicate word, will drive the red blood into the smaller vessels of the face and neck, and produce a *blush*. Bad news suddenly communicated will take away the appetite, and also, to use a common expression, "take away the breath;" and continued low spirits cause the body to waste away and become thin. An imperfect respiration, again, will disorder digestion and nutrition, and thus weaken the secreting power, and debilitate the nervous system itself. An irregular circulation cannot but disturb the lungs and the brain. A depraved digestion

will gradually involve in disorder every organ of the body; impoverishing the blood, lessening the supply in proportion to the waste, without which supply no organ can long continue vigorous; and thus even the brain itself will lose its power.

We cannot but admire the regularity and the tranquillity with which all the processes that have been mentioned are performed, from the hour of birth to that of death, except when interrupted by disease. The changes going on in the lungs, the perpetual action of the heart, the streams for ever flowing through the arteries, the digestion of food,—excite, under ordinary and healthy circumstances, no sensation. When they *do* excite sensation, the sensation becomes a most useful warning of disease—like the bell attached to the steam-engine, giving notice that there is something wrong in the machinery.

If we have succeeded in placing the few facts to which we have limited ourselves clearly before the reader, he will be at no great loss to understand the influence of some of the causes of disease to be spoken of in the following pages. Many of the appearances or symptoms of the disease itself will also be clearly comprehended; and the reasons for recommending certain precautions and means of relief will appear, as we wish them to appear, perfectly intelligible and plain.

The reader may here, however, be usefully reminded, how often those who pretend to cure all diseases incidental to the human frame

by quack-medicines, are without any knowledge of the frame which they undertake to mend. They profess to cure disorders affecting organs, of the appearance and actions of which they are quite ignorant. Regardless of the circulation, the respiration, or the digestion, how they are performed, or in what parts of the body, they undertake to keep all in perfect repair; and the bone-setter follows in the same track, pretending, by violent methods, to cure dislocations and other injuries of the joints, without so much as knowing how one joint differs from another. Surely, no man of common sense, who has had the means of getting a little insight into these particulars, should trust his body to be repaired by a man ignorant of its make and actions, with any more readiness than he would trust his watch to a workman who knows nothing of its spring, its wheels, and its motions.

A single example will make it evident enough that the proper management of diseases, whether they are but beginning, or have made serious progress, requires a knowledge of the form, nature, offices, and connexions of parts. Suppose a case, for instance —too common a case—in which a working-man, living in a large town, finds that somehow or other his health is altogether giving way, and that he seems to be "breaking up." When he goes to his dinner he has little or no desire to eat; when he goes to bed he lies restless and tossing without the refreshment of sleep, and he feels sick when he awakes; his

fellow workmen tell him he is wasting away, and he observes when he puts on his best coat that it hangs loosely about him; his hand is becoming unsteady; he finds that his work causes him to perspire more than he did; and he sometimes thinks his memory begins to fail him.

Now, if a man feels all these awkward symptoms, in what ought to be the prime and vigour of his life, the best thing he can possibly do—the only wise or safe thing he can do,—that on which his comfort, his strength, his independence, his very life, depends,—is to go at once to the best physician in his neighbourhood.

The physician will hear, very patiently, all that he has got to say: he will feel his pulse, and find it quick and feeble; he will feel his skin, and observe that it is harsh, and perhaps dry and hot; he will look at his tongue, and find it white; he will examine the condition of those parts of the trunk of the body where the stomach, the liver, and the spleen are situated; and perhaps he will find a little tenderness, or a little fulness and enlargement there; he will see that the patient's complexion is pale, or sallow—that the arteries and veins of his eyes and eyelids are distended with blood—and that there is a flabbiness of his muscles, and occasional swelling under the skin, as of the eyelids, arising from a peculiar state of the *cellular* tissue under the skin.

In these and other appearances, the physician sees more plainly than any words can speak,

that his patient's ailments have been produced by GIN-DRINKING. The patient finds that the doctor understands his complaint, and perhaps makes no attempt to deceive him, but tells him how long ago it is since he first learnt to raise his spirits by a dram—how this became more and more necessary to him—and how many glasses of gin he has at last come to drink every day of his life.

It " needs no ghost," as people say, to tell the poor man that this will not do—that he must leave off drinking, or that he will soon be in his grave. This is as plain to be seen as possible : the doctor tells him so ; but only tells him what any old woman would tell him who sees him walk along the street. Something more is wanted : health must be restored ; life must be preserved. But how is this to be done? Only by a careful study of the actual effects of ardent spirits on the actions of the body, from which effects those outward symptoms of paleness, and bloatedness, and trembling, and those inward symptoms of lost appetite, and weakness, and a muddled brain, arise

These effects are only truly and completely understood by one who has had several opportunities of seeing how such symptoms begin, and in what they end, and what changes are found to have been wrought by examination after death. All this the physician knows full well. He could tell the patient the very colour of his liver—what changes of colour and hardness spirits have made in it. He can under-

stand how the stomach has become feeble and irritable by the constant disturbance which strong stimulus has given to its nerves and its blood-vessels. He knows how the hardened liver must interfere with the proper return of blood from the stomach and bowels, and what general discomfort this must create, and what obstacles to proper nourishment. He perfectly understands how the brain itself has become troubled by the frequent excitement of its numerous blood-vessels; and can thus explain the restless nights, and the confused state of the understanding, and even the trembling of the hands:—he sees, too, the outward proofs of this excitement of blood-vessels in the blood-shot eyes.

Long attention to disease has taught the physician something more. He can tell the unfortunate patient, as surely as any prophet could tell him, how he will be, if he goes on as he is going on, six months hence, or a year hence. He can tell him, for he perfectly well knows, that he will in that time be unable to eat enough to nourish him; that drink will become more and more necessary to him; that he will become wasted to a skeleton; that the trembling of his hands will go on to complete loss of power to work; that the confusion of his mind will go on to the utmost mental weakness and stupidity; and that if he is not carried off by inflammation of the liver, or by fever, or by consumption, or by dropsy, or by the *cholera* (which carries off many of the drunkards), he will linger out his life in

the workhouse, poor, paralytic, and deserted—or, becoming insane, be sent to a lunatic asylum and die a madman.

For all this prophecy the physician could give the most exact reasons. There is nothing of fancy in it,—it is all truth.

Alarmed by hearing all this, or even part of it,—and having sense and strength of mind enough left to resolve to leave off drinking, the patient promises solemnly and sincerely to follow the doctor's good advice in all things. The doctor takes measures to lower the exeitement existing about the stomaeh, or liver, or brain,—to improve the strength, and to restore all the functions that are failing; and such is the power of medieine, properly applied and diligently persevered in, and eombined with strict attention to proper food and drink, that in the course of a few months a man may recover even from the lamentable state that we have described.

The other side of the picture will not require to be dwelt upon very long. Instead of going to a physieian, the poor man goes to a quack-doctor, who knows little and cares less about either his stomach, or his liver, or his brain,—who is utterly ignorant and regardless of the nature of digestion and nutrition, and of all that relates to the vigour and steadiness of the muscles, and to the general functions of the body and mind. *His* object is very simple, being nothing more than to cause the patient to swallow as many bottles of his medicine as possible before he dies. He has but one me-

dicine; but it is proper for anything, for any disease; good for the stomach—good for the brain—good for the liver—good for the legs. Provided the patient will take this medicine, he may take as much gin as he pleases. It is probably a violent stimulant, and adds to the mischievous excitement,—adds fuel to fire; or it is a violent purging medicine, or acts violently on the skin, or on the kidneys, and lowers the patient very rapidly. At length the unhappy man, thus deceived and trifled with, feels that death is approaching; and when he sends for a physician from the nearest Dispensary, or applies at the Hospital, which he might so easily have done before, it is too late to do him any good.

It is part of the object of this little book to teach the poor man better; to guard the working-man by knowledge; to show him that man is 'fearfully and wonderfully made;' and to convince him that whoever undertakes to keep the body in repair, ought really to know something about the way in which it is put together, by what laws its working is governed, and how the working may be set right when anything has put it out of order*.

* The reader who is desirous of more information concerning the structure and functions of the human body, may peruse with advantage the Treatises on Animal Mechanics, and on Physiology, in the Library of Useful Knowledge. An edition of Paley's Natural Theology, a book equally instructive and delightful, will shortly be published by the Society; in which, also, many of the contrivances in the human body are placed in a very striking point of view.

CHAPTER I.

OF DISEASES SUPPOSED TO ARISE FROM CERTAIN STATES OF THE AIR.

For reasons very imperfectly understood by man, human beings are exposed to various causes which disturb the actions that have been mentioned as going on in the frame of the body and mind, and produce disease. The most common cause of disease, however, is some kind of excess, which it is the business of the reason wherewith man is endowed to restrain, or some privation or want, which his instinct prompts him to supply. Thus disease is daily produced by excess in eating and drinking, by excess in exercise, or again, by want of good and nourishing food, and want of exercise. But there are causes of disease against which it is more difficult, if not quite impossible for man always to protect himself: there are changes continually going on in the atmosphere which surrounds him, and which it is essential that he should breathe; some of which changes invariably tend to disorder him. The temperature, or warmth and coldness of the air, for instance, is very variable in different seasons, in different climates, and in different hours of the day and night. Its dryness and moisture vary considerably. The quantity of electricity in the atmosphere is also liable to

variation, and the variation seems to affect the human body.

Besides these changes, which are constantly going on, there are other varieties in the air, not dependent, as far as we know, on any alteration of the materials of which the atmospheric air is composed, and yet which very seriously affect the health of man. Every one must have observed, that there are certain times in almost every year in which scarlet-fever and the measles make their appearance; almost all children who have not before had these diseases, becoming about the same time affected with them. Another disease, also, very different from the measles or scarlet-fever, being attended with little fever and no eruption, evidently depends on some peculiar condition of the air, which now and then prevails for a time, and then disappears,—namely, the hooping-cough, a spasmodic affection of the organs of breathing, supposed to depend on some irritation of the nerves which supply the organs by which breathing is performed. It is sometimes found that the three diseases just named are prevailing at the same time in almost every part of England. Sometimes they prevail very partially, being common in one town, and not seen at all in a town twelve or fifteen miles distant from it; and they are even sometimes prevalent in particular quarters of a large city, and not in others. After prevailing for a time, they disappear altogether; for although they are supposed to be communicated by those who have already caught them, to others who

have not had them, this communication seems to cease, also, when the peculiar state of the air is at an end in which persons may take the disease even without personal communication with those already affected.

The same circumstances are observable with respect to the common fevers of this country. In different years, they are more or less prevalent, and very different in their character; not only different in the degree of excitement which attends them, but in affecting, in their course, different organs of the body with inflammation rather than other organs. Sometimes there is very little excitement, and the fevers of such seasons are said to be typhoid, or low fevers; sometimes there is greater excitement, and the fevers are said—not very correctly—to be inflammatory; sometimes it is observed that the majority of patients affected with fever are attacked, in the course of it, with inflammation of the lungs: and after a few months it is found that very few of the cases of fever are attended with inflammation of the lungs, but almost every case becomes complicated with inflammation of the bowels.

There seems, occasionally, to be a connexion between mere temperature, the warmth or coldness of the weather, and certain of these varieties. In the East Indies, it is a general observation, that the greater heat of the climate has a particular action on the liver, stomach, and intestines, and constantly gives a particular character to the fevers prevailing in those regions of the earth. It is also observed, that

the yellow-fever, so common in the West Indies, and so fatal to the troops sent from England, only prevails in those years when the heat has for some time remained steadily above the summer heat of our climate. It is for this reason, perhaps, that at certain heights, even in the climate in which yellow-fever prevails, it never appears. The height of about 1800 feet above the level of the sea seems to be its limit*; but this has been accounted for by the supposed weight of the noxious air, or *malaria*, which keeps in the lower regions. On the other hand, the plague, which every year prevails on the eastern and southern shores of the Mediterranean sea, disappears as the summer advances; so that on a particular day, about Midsummer, a gun is fired by the Turks as a formal announcement of its departure.

In other cases, there is every reason to ascribe disorders to circumstances closely connected with the moist air of marshy places. In some parts of Lincolnshire, and Cambridgeshire, and Essex, the *ague*, which is an intermitting fever, coming on every day, or every other day, or, in some cases, every third day, and consisting of three stages,—a shivering or cold stage, during which the patient is affected with violent and universal tremor; a hot stage, in which his face becomes flushed, and he is sometimes delirious; and a sweating stage, with which the attack goes off;—is continually to be met with: and the parts of these counties where it is thus met with abound in marshes.

* Humboldt.

In Holland, a low and damp country, the same disorder is very prevalent; and, after the giving way of the dikes a few years ago, when a large tract of land was laid under water, the disease was nearly universal throughout that district, and almost every Dutch sailor who came to London brought the ague with him. In some parts of Italy, as in the famous Pontine marshes in the neighbourhood of Rome, the same disease extensively prevails, and has, we know, prevailed for at least two thousand years. There is no situation so abounding in ague and other fevers, as the *rice* grounds in Italy, in North America, in India, and on the coast of Guinea; in the latter situation, a European can hardly sleep a night on shore without catching a fever; but the negroes who are born there live and thrive. The rice-grounds are frequently allowed to be covered with water, and then to become gradually dried by the sun. Since inclosures and draining have become general in England, agues have become rare, There is hardly any part of England in which the older inhabitants do not tell you that when they were young, agues were common, and that now they are seldom heard of; and, about two thousand one hundred years ago, Hippocrates, an ancient Greek physician, who is usually called the father of physic, finding that the city of Abydos was very unhealthy, and much infested with fevers, advised the draining of the marshes near it, and the fevers disappeared; so that altogether the connexion between marshy grounds and fever,

especially the kind of fever called ague, is very evident.

It is generally believed that, in all these cases, whether of fever, yellow-fever, plague, or ague, it is neither heat alone, nor moisture alone, nor any variety of either, nor any combination of both, that is solely concerned in their production. Something hurtful is supposed to be added to the usual air,—something hurtful, but which science has not yet succeeded in detecting. It cannot be seen, or tasted, or touched, or smelt; it has neither palpable substance or colour; but we believe that it exists, because of certain effects which we know *not* to arise from those parts of the air which we *can* see and examine.

It is possible, although such a supposition is not countenanced by medical authorities, that the hurtful agent may, in all parts of the world, be one and the same; and that certain combinations of temperature, moisture, and electricity only give to fevers a variety of characters at different seasons, in different parts of the same country, and in different climates: sometimes causing a difference in the character of the fever itself, sometimes directing the principal force of the disease to some particular internal organ, and sometimes throwing it out upon the surface.

All that we can say at present is, that the varieties of the diseases called, from their partial prevalence as to *time*, *epidemic*, do not depend on any *known* changes in the consti-

tuents or materials of our atmosphere *. The different kinds of air of which the atmosphere is composed, exist in the same proportion to one another, as far as trials have been made, in every part of the earth,—on the summits of the highest mountains, and in the deepest mines,—even at the greatest height to which balloons have ever ascended,—and are the same in crowded cities, and in solitudes where scarcely a living creature breathes.

Happily, however, experience has taught us many means of mitigating, and even to a certain extent, of avoiding, the effects of the unknown agent. By extensive improvements in cities and in modes of life, some of the worst effects are now very rarely seen in our country; and others unknown among us are mitigated, where they are yet known, by the science which medical practitioners carry into other climates. Even the common disorders of measles and the scarlet-fever, which used to be, in certain years, almost as destructive as the plague, are now so far controlled by proper management,

* The ague belongs to a class of diseases called *endemic*, being partial as to *place;* and the causes of endemic diseases are commonly pretty well understood. Some endemic disorders, however, as the swelled neck or goître, or bronchocele, as it is called by medical writers, depend upon causes about which there is yet much difference of opinion. The swelled neck chiefly prevails in the low and damp vallies of mountainous districts; as in the Alps, which divide Italy from France and Switzerland; in the Pyrenees, which divide France from Spain; and in Derbyshire and other hilly parts of England.

that very severe cases form an exception to their general character. In some years, they show a more general disposition to severity than in others; but this disposition is so checked by proper care and treatment, that it never becomes uncontrollable. The fevers of this country only present their most terrible features among patients whose situation shuts them out from the means of prevention or cure which modern physicians know how to employ. The general character of our fevers has been so completely changed by alterations in the manner of living, and in the practice of medicine, that for the last hundred and sixty years, or since the great fire of London, the word *plague* has not been mentioned in the bills of mortality; although there are many reasons for believing that the disorder of which so many thousands died in London a few years before that event, and which is commonly known as the Great Plague, was but our common fever in its most severe and exaggerated form. So also the dreadful dysenteries (or 'bloody-flux,' so much spoken of by the writers of that period,) are now nearly unknown in this country; and severe cases do not occur in such numbers as to give to the dysentery the character of a dangerous epidemic.

These good effects arise, in a great measure, from our streets being drier and better paved, and cleaner, and from the houses and persons of all classes being kept in a greater state of neatness. In cities, or in parts of cities, where

the old neglect prevails, the worst diseases prevail also.

Among the descriptions left by Sydenham, a famous physician who practised in London at the time now alluded to, we recognize, existing at the same period, various forms of fever, from the slightest up to the plague itself, and also various forms of irritation of the bowels, including the dysentery, as well as some instances in which the symptoms very closely resembled the cholera itself.

The very severe cases resembling cholera, although spoken of by the older writers under the title of plague, have, like the very severe cases of fever to which the name of plague was so often given, nearly disappeared from England, or, at least, have become so rare, as not to excite any general alarm. Not a year passes without one or two epidemic fevers visiting this country, in the course of which those medical practitioners who see much of the patients in the most miserable quarters of large towns—as in Drury-lane, and the courts of Gray's Inn-lane, in London—and sometimes even those who practise in the country, meet with cases answering to the worst descriptions of spotted fever and plague, as they are described to have existed in England. Not an autumn passes without many cases of cholera being met with, *a few* of which present the most severe and frightful symptoms of the malady. But, generally speaking, the habits of the people, the state of our towns, the cleanliness of private

houses, and a judicious treatment, so control and modify these diseases, that the severe cases still continue but exceptions.

We have this year had what is called an 'old-fashioned summer;' such a continuance of fine weather as we have not for many years been favoured with. Nothing has seemed to indicate that any causes of disease were hovering over us. Yet, in the early part of the summer, there prevailed all over England, and almost all over Europe, a disorder affecting the lining of the windpipe, something like a common cold, but attended with pain of the head, and violent nervous disturbance, so as to acquire the appellation of an influenza. Hardly had this disappeared, when another form of disease arose, in which the lining membrane, and probably the nerves, of the stomach and bowels were affected,—some of the patients having sickness, others diarrhœa or looseness, a few dysentery, and many what we call the *English* cholera, but more severely than usual; whilst in some parts of Europe, a cholera unusually severe and fatal, advancing fast from one city to another, and from one country to another, has reached the north-eastern part of our own island.

It is to be acknowledged, that in the opinion of the greater number of medical authorities, the plague is a disease quite distinct from our common fevers, even of the worst kind; and the cholera of the East, and that now prevailing on the Continent, a distinct disease from any form of our English cholera. The deter-

mination of this question cannot affect the historical truth of the foregoing observations: but the general dread now existing of the appearance of cholera in its worst form—in a form which has proved alarmingly fatal for many months past in many cities of Europe,—gives to a description of this disease as it has at different times appeared in various parts of the world, and in this country, a great degree of interest; and an exposition of its nature cannot fail to impress on the minds of those who peruse it the best methods of avoiding it, or of controlling its ravages.

That the disease has actually appeared in England is no longer a matter of doubt. That it has already carried off many of the aged, the sickly, and the intemperate, at Sunderland, is stated by a physician who is well acquainted with the Indian form of the malady*. Its progress from Sunderland to other towns, although slow, has been certain;—and in one place, Gateshead (a close and dirty neighbourhood connected with Newcastle by a bridge across the river Tyne), it seized upon its victims with a frightful energy†. But whether the progress of this disease be slow or rapid, every man in his senses will do his best to guard against it, and spare no pains to understand what may be expected, and how it may be best overcome if it should attack him.

* Dr. Daun. † See Postscript, p. 204.

CHAPTER II.

DESCRIPTION OF CHOLERA.

The disease which is called *Cholera,* or Asiatic Cholera, or *Cholera Morbus,* or *Spasmodic Cholera*, is often spoken of as one which was unknown until about fifteen years ago; but it is evident, from the description of the older writers both of India and of Europe, that the disease had frequently been seen before. Its appearance is shown to have generally been as sudden, and its attacks to have been as violent as in later times. Persons in full health became all at once seized with convulsions, and died in a few hours; the disease in these respects resembling one which the Indian writers describe, if not indeed the very same disease, and in which the whole case is often comprehended in the words "*Being seized with vomiting and purging, he immediately died.*" In the year 1781, a division of Bengal troops, under the command of Colonel Pearse, was attacked by the disease with as much fury and with results as fatal as if it had encountered the enemy: men who seemed to be in good health became suddenly ill, and dropped down "by dozens," dying almost im-

mediately. At an Indian festival in 1783, above twenty thousand of the people there assembled were destroyed by cholera

But it was not until the year 1817 that it began to excite general attention, caused great alarm, and became the subject of careful observation. In that year it prevailed in India most extensively, beginning without any known cause, unless some irregularity in the seasons can be looked upon as such, and continuing to spread in every variety of season and weather, in every variety of heat and cold, and rain and drought, attacking Indians and Europeans, and people of all constitutions.

It commenced in Bengal, from which part of India it has hardly ever since been absent; in the next year, 1818, it passed on to the Coromandel Coast, or Presidency of Madras, where, with the exception of two years (1826-27), it has, more or less, ever since prevailed. In the same year (1818) it visited the coast of Malabar, or Bombay Presidency, and spread to the Burmese empire; and it is traced in 1819 to the islands of Penang and Sumatra, to Ceylon and Malacca, and to the Mauritius; and in 1820 to China, and successively throughout large portions of Eastern Asia; to islands in the African Ocean; to Arabia, to Mesopotamia, Syria, and Judea, in 1821; to Persia in 1822. At length it appeared in Russia. It extended to Poland in March, 1831; it appeared in Prussia in May, and also in Austria. In June it reached St. Petersburg: in October

it appeared at Hamburgh, and in the same month its existence in this country was first discovered.

The cholera, as it has always appeared in India, may be thus described. After reading the introduction to the present volume, there will be no difficulty in understanding the whole of the description.

Unlike many diseases, the cholera often begins without what may be called warning symptoms. Sometimes the patient is first affected with nausea, or slight irritation of the bowels, or pains or cramps in the legs; but very often there is no warning at all. Perhaps the patient, on awaking out of his sleep, and having gone to bed in health, is all at once most violently affected with spasmodic pain in the bowels, sickness, and purging; and his pulse is hardly to be felt. A man is well at breakfast and dies before noon. Or a man has been out drinking at night, and is attacked with cholera at day-break. Practitioners, however, who are engaged with the troops in India, well knowing the destruction which the malady brings into an army, have learnt to be so watchful that they say they can often detect the approach of cholera before the patient begins to make any complaint at all. The *look* of a patient tells them what is going to happen. A skilful doctor generally knows a great deal more than he can teach others to know: habits of observation enable him to read disease in the countenance where an un-

taught eye would see little or no departure from the appearance of health.

If the doctor of a regiment in India, at a time when cholera is prevailing, sees any man on the parade with an expression of distress or anxiety in his face, or looking hollow-eyed, or of a dirty earthy colour, such colour not being natural to him, he often sends him off to the hospital at once; for these slight alterations of appearance are the very first signs of the coming of cholera. It is not often, indeed, that a man looks in this way without feeling himself a little out of order. If he is not absolutely sick, he is uncomfortable. His hands and feet are cold, his nails look blue, he complains of heat at the pit of the stomach, and his bowels are commonly disturbed. This disorder of the bowels (*diarrhœa*, or purging) has a particular character, for the bowels are violently moved, as if they were completely emptied at once, and the patient feels very weak.

Fear makes people quicksighted; those who know nothing of medicine, soon learn, if in India, to know the look of a man whose health is going wrong. An officer sees something odd about the appearance or manner of his servant: the man looks ill, and is a little deaf; but on closer examination by a doctor, the poor man is found to be colder than usual, his pulse is very much sunk, his bowels are not right and he soon becomes dangerously ill.

No active and industrious man likes to complain of being ill without great cause. No good soldier likes to miss parade or duty unless he is very ill. If a man makes frequent complaints, and has little or nothing the matter with him, he loses that character which a good soldier is too proud to give up. This good feeling often makes a worthy fellow suffer all the first symptoms of cholera without saying much about it, and from this cause it unluckily happens that the first symptoms are often neglected. In seasons of sickness, the surgeons of regiments go down the lines every morning, and examine every man attentively. Those who are not soldiers are not so well looked after; but when cholera is prevailing anywhere, every man ought to pay attention to such slight feelings of sickness as he would at other times disregard. The English working-man should now remember this, no less than the Hindoo.

In the confirmed stage of cholera, when there is no longer the least doubt concerning what is the matter, the countenance is still more strongly indicative of the disease. It is altogether altered, so that it is sometimes difficult to know that the sick man is the man whom you knew when in health; and this alteration takes place in a remarkably short time. All the features of the face seem contracted and shrunk; the lips are blue, the eyes seem to be sunk in the head, and there is a ghastly look about the mouth. In this stage the bowels have always been violently moved, and

much weakness is felt: deafness and giddiness are not uncommon; the heat and pain of the stomach are of a burning kind; the patient is very thirsty, although the tongue, which is white, seems moist: the skin is very cold, and a particular coldness of the *tongue* is also observed. There is now, generally, both vomiting and sudden and violent purging, and the discharges are peculiar; not natural, not bilious, not like what has been taken as food, but watery, or like a turbid fluid, or like water in which grain has been boiled, with whitish fragments floating in it, or like the seethings of oatmeal. Thus it is commonly said that the matter discharged is like "rice-water." The purging is a more constant symptom than the vomiting, which sometimes does not take place at all. Nor is there always much pain of the bowels, or tenderness when they are pressed. The stools are often like water. In the worst cases of all, there is neither vomiting nor purging, the stomach and bowels seeming to have lost all power.

In a violent case of cholera, the same symptoms are present, but all of them are more severe. The face, in the first place, is more extremely altered, and also the voice, so that the change in the patient is much more complete. His eyes look completely sunk, and there is a dark circle round them. The lips are blue or bloodless. The cold and livid skin is covered with cold large drops of perspiration, although sometimes there is a feeling of burning heat in it; the hands and feet are

not only excessively cold, but are wrinkled, as if they had been held a long time in water. The tongue and the breath are cold. So insensible is the whole skin, that if blisters are applied they will not rise. But the patient also suffers from dreadful spasms: these begin, like cramp, in the feet or in the hands, and stretch up to the trunk of the body; or the muscles of the fore part of the trunk are violently contracted, which is what is meant when it is said they are affected by *spasms*. Spasms and cramps in the legs are violent contractions of the muscles of the legs, and every one who knows the pain which attends a common "cramp of the calf of the leg," may imagine the sufferings of a patient in cholera, where such pains are continued, and affect many more muscles. In some instances the spasms are so great, that it is necessary to hold the patients down; and they sometimes say they feel as if their arms and legs were breaking.

With such violent disorder of parts so important as the stomach and bowels, it is not surprising to find that the action of the heart and the circulation of the blood are greatly interfered with. The heart and blood-vessels, however, are disturbed or weakened from the very first, as well as the stomach and bowels: but in the greater violence of the attack, there is, with the great coldness of the skin that always follows a weak circulation of blood, such a weakness of the heart that it can hardly be felt to beat, or even seems, when the spasms

come on, to stop. The blood itself is changed, dark-coloured, very thick, and soon coagulates, when drawn, into a dense mass: or it can hardly be forced out of the vein in the smallest quantity. At this stage of the malady the breathing is also sometimes much troubled, slow, and oppressed, and the breath is cold. Still, with this lowness of the pulse, and slowness of breathing, and coldness of breath, and shrunken and chilled skin, the patient feels tormented by heat, throws off the bed-clothes, and begs those about him to give him cold water to drink, and to let him have cool air. Almost all the functions of the body are imperfectly performed. What are called the secretions are very scantily formed: the glands of the mouth form little or no saliva, so that the mouth is dry; the kidneys little or no urine; the liver little or no bile.

It is needless to describe the last miserable stage of the disease, when death is fast approaching; when the spasms both of the limbs and trunk, and of the stomach and bowels, are at an end; when the pulse in the arteries can no longer be felt, and the feeble fluttering of the heart can hardly be perceived; when the greater coldness and dampness of the skin, and the glazed eyes, present the image of death itself. But amidst all these signs of departing life, the patient often continues sensible until life is quite extinguished. The mind is very little or not at all disturbed during the whole course of the malady, but its energy is of course weakened. Its sensibility

in the last stage of this dreadful disease has caused observers to compare a man in this state to "a living corpse." But even after sensibility and every sign of life has seemed to be gone, the power of contraction in the muscles is sometimes suddenly displayed; and the bye-standers are alarmed at the unnatural spectacle of spasmodic motions in what they considered to be a lifeless body; and fears have been sometimes expressed, that people have been buried before they were dead.

All these terrible changes, which commence in the midst of health, and end in death, are generally completed in sixteen hours. Different observers have made different reports, which must always happen when the reports are faithfully made, for there must always be varieties in different circumstances. Sometimes the patient lingers in the state of stupor which is the forerunner of death for a whole day; but not unfrequently death comes on in a much shorter time, even in four hours from the first symptoms of illness, or, at least, from the attack. The old and infirm sink rapidly. The patient is sometimes like a man poisoned: the spasms may be slight, or may not come on at all; the vomiting may be trifling; the bowels may be once violently moved, and the patient all at once brought to death's door. A patient, feeling himself ill, will perhaps walk to speak to the surgeon, but his pulse is found to be already gone, and his heart to have ceased to beat: an attempt is made to bleed him, but only a few drops of

blood can be procured, and the patient dies without more complaint*. In some instances people dropped down when in the market or in shops, and very soon died; even in the short space of a quarter of an hour.

In happier cases, when the patient lives, and overcomes the malady, the first ray of hope arises with a little returning strength of the pulse, and a little return of warmth in the skin. If these are observed, and the spasms also subside, the patient perhaps feels some inclination to natural sleep, and the stools become natural; and the secretions of saliva, of urine, and of bile are renewed, and all the functions of health are gradually restored. But the improvement in these cases is seldom perceived until the patient has been suffering for twenty-four hours or more; and it is also observed, that as the pulse rises it will sometimes become sharp and hard, and the tongue will become furred, and the thirst will continue,—a state which resembles that seen in typhus fever; and during the continuance of which the state of the bowels is far from natural, the motions being dark or black and pitchy, or abounding with unhealthy bile. It also sometimes happens that this state of fever continuing becomes more and more like a typhous fever, and destroys the patient after recovery from cholera had seemed to commence.

The natives of India, who, although not a strong people, are healthy, and very little

* Bell on Cholera Asphyxia.

liable to inflammatory disorders, often recover from attacks of cholera with surprising quickness; so quickly, indeed, that the recovery is compared to recovery from a mere fainting fit, or from a fit of cholic. The people of our country, who live in India, are seldom in very good health before the attack, and are more disposed to inflammation; so that when they are getting better of a severe attack of cholera, they are often attacked with some disease of the brain, of the liver, of the stomach, or of the intestines.

What, then, is the nature of this dreaded disease? Keeping in mind the introductory chapter on the structure and offices of different parts of the body, let us try to understand how the offices or functions of the body are interrupted in cholera. But first, it is necessary to pay some attention to the appearances which are found when the bodies of persons who have died of cholera are examined after death.

The stomach and bowels, being so violently affected during life, must of course be objects of peculiar interest after death. In some cases the whole of the intestines, and also the stomach, are found empty, and the lining membrane of them pale. But in lingering cases, the stomach shows signs of having been inflamed. It generally contains some substances of a greenish, or yellow, or turbid appearance, and sometimes only the undigested food. The intestines are also found to con-

tain, in parts of them which are swelled out into bags or pouches, turbid fluids of various colours—light-coloured, or greenish, or dark; and some parts of the intestines are found contracted or narrowed. No solid matters are found. The lining membrane of the intestines is covered, in a state of health, with mucus, or a soft, oily kind of fluid; this is sometimes found wanting in cholera, and sometimes abundant and changed in its appearance. It is rare to find bile or food in the intestines. Sometimes there are marks of inflammation in different parts of the bowels.

The liver is commonly said to contain more blood than natural; and the gall-bladder is generally full of bile, which, as is almost always the case when its discharge into the intestines has been prevented, is of a dark colour. The gall-ducts, or canals by which bile passes from the liver into the gall-bladder and into the intestines, have often, but not always, been described as closed or filled up.

In all cases of cholera, the urinary bladder is said to be found quite empty and contracted. The lining of this organ, like that of the stomach and intestines, is covered, in health, with mucus, to protect it; this has been found in increased quantity.

The lungs are not always changed from their natural condition, but sometimes they are gorged, and full of blood, and resemble in appearance the liver or the spleen; and sometimes they are contracted, so as to leave a large

part of the chest quite empty, forming a complete vacuum. The blood which the lungs contain is very black.

The heart, and the great vessels which bring the blood to it and carry it away, are found distended with blood; and this distension with dark or black blood is found both on the right side and on the left, in both the auricles and in both the ventricles.

As might be expected from the violence of the disease, and its effects during life on the outward character of the body, those who have died of it often look like those who have died of a long and wasting disorder. The general appearances after death, then, are a shrunken state of the surface, a gorged or very full and distended state of the large internal vessels, and of some of the internal organs; with more or fewer signs of disease in the stomach and bowels, and occasionally with collections of matter in them resembling that which was discharged by vomiting and purging during life. These seem to be but slight alterations to be found after so violent a disease. But the violence of the disease in some measure explains the slight alterations in the form and appearance of parts; for all disease begins with disordered actions or functions, and it is generally by the long continuance of disordered actions that changes are wrought in the appearance and structure of the parts diseased For the same reason, when the cholera is subdued, the patient in India often gets well at once. Nothing but weakness is left, at least,

unless some disease has been going on before the attaek, or unless symptoms of fever come on.

In cholera there is most violent disordered action; so violent, that a man is killed before there is time for many changes to be made which can be seen after death. He dies like a man who has taken a deadly poison, or who has been bitten by a poisonous snake. All his energy seems either at once overcome or rudely impaired. Sometimes, indeed, he dies so soon, that he may be said to be like a man killed by lightning; his nervous power or energy seems all to be struck out of his frame at one blow:—his heart no longer beats, his blood no longer flows, and he sinks at once. But the resemblance to the effects of poison is commonly more striking; all energy, except the irregular energy shown in spasms, is overpowered; and when this irregular energy is gone, life soon departs also.

Those who look into medical books for information must expect to meet a great variety of opinions on this matter. Even the anxiety of medical men to know more than they at present do, and to do more than they at present can, leads to contradictions. Seeing all the functions so soon oppressed, and with such violence, many are not content to think that it all takes place from one cause. Some, attending to the vomiting, think the man dies because of the disorder of his stomach and bowels; some, attending to the discharges, think the disease arises from the want of bile; some, looking only to the dark and altered

state of the blood, and the weakness of the heart, think death arises from a want of the proper changes going on in the lungs, by which (as has been mentioned in the Introduction) the blood in the veins is rendered fit to go into the arteries; others, considering the scanty state of the urine, have even fancied cholera was a disease very much connected with some disorder of the kidneys.

If any one of these changes invariably happened *first*, and the rest followed, we might believe such first change to have a great deal to do with the disease; but all the changes take place at once, or at least are always very speedily effected. The heart is weakened, and the stomach and bowels are disturbed, and the bile and urine are suppressed, and the blood in the veins ceases to be properly changed in the lungs, either all at one time, or so nearly so that we cannot say which is first.

A patient affected with cholera is, in fact, under the influence of a poison, communicated to him from the air, and at once so strongly affecting his brain and nerves, and his heart, that no action in the body can possibly go on well. All the functions of the nerves, and all the functions of the blood-vessels, are impaired together. The blood is no longer good blood; the nervous energy, or influence, is no longer powerful; the proper secretions do not take place into the stomach, and digestion no longer goes on; the blood no longer flows into the smaller vessels; the action of the heart itself is hardly continued. There is no proper

supply of blood for any secretion, or for nourishment; there is no control or proper government of the actions of the body, and the muscles become disorderly, and contract excessively and irregularly,—no longer obeying the will, nor any longer acting in the usual manner on the contents of the bowels without our will being concerned, as they do in health, but acting in spasms, and with disorder, and with extreme pain. The warmth, too, and the sensibility of the body are rapidly extinguished; and the sensations so disordered, that whilst the skin has all the coldness of death, the stomach seems a prey to a consuming fire, or the whole body oppressed with a devouring heat.

Medical men have not yet determined how the poison of cholera is introduced. It is sometimes imagined that the skin affords a passage to it. But seeing that we continually breathe air, and that the air we breathe continually acts on the blood, it seems pretty clear, that if it is a poisoned state of air which produces cholera, the air thus poisoned must affect the blood in the lungs, and by so doing, by impairing its qualities, probably lead to disorder of every part of the body. It may be that the poison of cholera acts at once, and first, on the nervous system. The question, however, is chiefly of consequence to medical men. That the stomach and bowels become violently irritated, is plainly enough seen in the vomiting and diarrhœa; but whether this irritation is the *consequence* of disordered fluids being formed in the bowels or whether these disordered

fluids, or secretions, are the consequences of previous disorder of the nerves, or blood-vessels, or both, is another question not very easily decided.

Enough, however, is known of the nature of cholera, to teach us how it ought to be treated, or warded off; and that, which will be explained in another chapter, is the chief consideration for the public.

Such, then, is the dreaded Indian cholera; such is the disease which has, more or less, prevailed over the whole of India since the year 1817, and has since spread into our colder northern regions. It began in that year with little or no peculiarity in the state of the air. The changing seasons did not affect it; coldness and heat, dryness and moisture, did not check or increase it. It prevailed when the soil was burnt up with heat; and it continued to prevail when it was deluged with rain. It attacked both the native Indians and the Europeans, and no constitution seemed proof against it.

So long, indeed, and so violently has this disease prevailed, that it is difficult to credit all that is truly said of the destruction of life that it has occasioned. It seems beyond belief, that any one disease should destroy in one year more people than are contained in such a vast city as London, yet, for fourteen years past, the cholera has destroyed twice that number in every year; that is to say, on an average of the years, it has destroyed three millions of people in each year. It has

passed over large portions of the earth like a destroying angel, spreading from one desolated city to another affrighted place, with a certainty and force which nothing could withstand.

It first appeared in countries so different from our own, in every particular, that we could hardly expect its approach to the shores of England; but it has gradually come nearer to us, and, after spreading over almost every part of Asia, and a certain portion of Europe, has crossed the German ocean and landed among ourselves.

CHAPTER III.

CLIMATE AND HABITS OF INDIA.

But the reader, unaccustomed to medical details, is perhaps weary of descriptions not always fully understood, however plainly described, without more preparation in anatomy and physiology than he happens to possess.

Let us turn, then, aside from this strictly medical discussion, to consider the vast and peculiar country where the cholera first began to scourge the human race. With the reputed *wealth of the Indies*, no one is quite unacquainted. An inspection of the map will show the large extent of Hindostan, and its situation, with respect to China, to Arabia, and Persia, and to the great continent of Africa. Long before any nation had learnt to sail round that southern Cape or promontory of Africa, called and marked in the map as the Cape of Good Hope, the wealth of India, and its various produce of silk, of spices, and of precious stones, had caused it to be eagerly invaded by conquerors, and visited, over land, by merchants and traders. It was the scene of many of the conquests of Alexander the Great; it was the country from which the Romans often returned victorious, and laden

with rich and costly spoils; and it was the country, by intercourse with which the once proud city of Venice, built upon the Adriatic sea, became the first commercial city in the world, though now ruined and gradually falling into loneliness and decay. But about the time that Columbus made the discovery of America, a Portuguese admiral, whose name was Vasco de Gama, discovered that it was possible to sail round the south coast of Africa, and to reach India without crossing other lands. Before his discovery, it was believed that Africa stretched out to the west. The ancients knew too little of ship-building and the art of sailing, to venture so far, and the true shape of Africa had never been properly inquired into by any of the moderns; few of whom possessed sea-ports so conveniently situated for sailing out on voyages of mere discovery in that direction, as Portugal*.

When the Portuguese admiral arrived in India by sea, the king of that part of the coast on which he landed, greatly astonished by a visit from a new people, whose dresses, arms, and language, were equally strange to him, received his new visitors with pleasure, and treated them with hospitality. But soon, perhaps suspecting that they would try to get the mastery over him, and bring destruction and tyranny into his country, he treated them as his enemies. The Portuguese discoverers,

* Herodotus, a Greek historian, states that the Phœnicians sailed round the cape of Africa which we call the Cape of Good Hope; but the fact is doubted.

however, returned home in safety, and were not long before they led their countrymen back to a land, promising them all the advantages of a trade in the luxuries which European nations were desirous to possess, almost at any price. After many struggles, both with the Venetians, and with the Tartars and Arabians, who were already masters of part of India, the Portuguese succeeded in getting nearly the whole of the Indian trade to themselves, and they kept it unmolested for a hundred years. The nations of Europe were, for the most part, too busy in quarrels with one another to undertake any attempts on a country so distant.

The first people who disturbed the Portuguese in their Indian possessions were the Dutch, who were already an adventurous trading people, and now showed that the most difficult undertakings may be accomplished by a people who are industrious, courageous, and persevering.

The English soon followed the example of the Dutch, and, at the present day, they are almost the only nations who exercise government over any part of the vast population of Hindostan.

To maintain the wide dominion of England in India, it is necessary always to have many troops there. We have also a Governor of India, who resides at Calcutta. Commercial speculations, and various offices, civil and military, cause many people from this country to spend a part of their lives in an Indian climate. Most Europeans go to India at an

early age, and seldom return, unless driven back in bad health, until the prime of life is spent and gone. The number who die there, before the ordinary period of a man's life is accomplished, is extremely great; and of those who return, there are few whose pale or sallow complexions do not show that they have purchased riches at the price of health. This arises partly from their having been so long in a country possessing a climate so very different from that in which they were born, and partly from other causes.

Various circumstances exist in the climate and soil of the British possessions in India, which are thought by those who have passed many years in that quarter of the globe, sufficient to account for the greater prevalence and severer character of the fevers, the diseases of the liver, and the dysenteries of the East, and even of the cholera itself. In a country extending over thirty degrees of latitude*, the climate, of course, varies very greatly in different situations.

A general description of the climate of Bengal, the presidency in which Calcutta is situated, which is the seat of the government, is, that, as with us, the cold season commences in November; it ends in February. But the cold weather, being dry also, is the *fine* weather of the Indian climate. November, which is often with us so gloomy, is a delightful month

* An explanation of what is called latitude, and a description of a common thermometer, will be found at the end of the book.

in Bengal. They have an agreeable cold wind from the north, the air is dry, and the nights are clear; the thermometer ranges from 66° to 86°, so that the weather is often what we should call warm, and never perhaps what we should call cold, except when the wind blows strongly, for that makes a great difference in the sensation of cold. In December, the Indian weather is colder, the thermometer ranging from 56° to 78°. In January, it ranges from 47° to 75°; consequently, never so low as our freezing point, which is 32°; but still the air is described as 'piercingly cold.' But about the middle of February, those who are new to the climate begin to have some foretaste of its peculiarities. The wind changes to the south and east,—the middle of the day grows warm,—the clouds gather in the horizon,—thunder is heard from time to time, and indicates that the hot weather is approaching The thermometer now ranges from 65° to 82°. Up to this time, the health of those residing in India is well preserved; the dryness and bracing qualities of the air benefit those even who were invalids before. Even plants, which cannot live through an Indian summer, grow and flourish in the refreshing air of winter.

In March the hot season commences. About the middle, or towards the end of the month, distant thunder is heard in the evenings, and strong gusts of wind are felt. Soon after this, the storms called the 'north-westers,' come. "The boisterous morning wind settles into a dead

calm; the air is sultry, and the clouds gather thickly. Lightning and thunder approach nearer and nearer, until the calm is all at once broken in upon by a tremendous burst of wind, sending up clouds of dust which darken the very air. Torrents of rain generally succeed, or sometimes of hail, but sometimes neither; and the violence of the storm is soon passed. These storms rarely occur earlier than six in the afternoon, or later than midnight*." The thermometer during March ranges from 73° to 86°.

April and May are hot, and generally oppressive, but relief is often afforded by violent storms and rain. The thermometer, in April, ranges from 78° to 91°; and, in May, from 81° to 93°.

Some time in June, and commonly about the beginning, the regular rainy season commences. The wind veers to the east; there are evening thunders; and the atmosphere is continually cloudy. Then follow several days, perhaps, of such heavy rain, that the sun is never seen; and, for four months, there is a frequent return of such heavy rain for forty-eight hours or more at a time, with intervals of tolerably fair weather, often very suddenly interrupted. Lightning and violent thunder-storms, and terrible gusts of wind, are common during the whole of the rainy season; but as the atmosphere becomes cooled by the rains, it is more agreable than before. Now and then, how-

* Jamieson's Report on the Epidemic Cholera.

ever, there are sultry nights, with a dead calm, preceding a violent storm. The thermometer ranges from 77° to 88° or 90°.

About the middle of October, the rain and storms gradually cease; the mornings and evenings grow cool; the air becomes brighter and more elastic; the wind gets round to the west-north-west; the clouds and vapours disappear; the thermometer falls, and the cold season commences.

It appears, by the Medical Returns of the presidency division of the European army, that fever is most prevalent in the rainy and hot seasons; dysentery and diarrhœa in the rainy and cold seasons; and inflammation of the liver and *cholera* in the hot season.

The climate of the Indian *peninsula*, including the presidency of Madras, is visited by periodical winds called the *monsoons*, blowing from the north-east from the middle of October until the end of February, or beginning of March. All this period is a dry season, except on the east or Coromandel coast of the peninsula, where it is always attended with rain. The south-west monsoon blows over the peninsula from the end of May to the end of August; and this is the rainy season in the peninsula, except on the Coromandel coast, where it is dry; that coast differing in this particular from all the rest of India. The range of the thermometer at Madras is generally from 75° to 92°; but, in hot months, as high as 98°, or even 105°.

It may be understood from this imperfect

description of the Indian climate, that the two circumstances of *great heat*, and tracts of country liable to *occasional inundation*, *and then to a gradual process of drying*, are frequently conjoined. The broad-extending branches of the Ganges are seen to spread far over the map; and this river alone, after it has left the mountains, in which it pursues a course of several hundred miles, receives eleven rivers into its waters, none of them smaller than the river Thames. The difference between the wet and dry season is such, that a house may be on the banks of the Ganges at one time, and left, in the dry season, two miles away from it. The soil, too, is scattered and mingled thickly with the remains of a vegetation far more abundant than what we know in temperate climates, and also with the remains of innumerable insects and reptiles. We see, in our own climate, that whenever we have a certain degree of heat acting upon a rank luxuriance of soil, decayed vegetable matter, and the remains of the numerous insects which abound in damp places and seasons, we have agues produced, or other fevers, or dysenteries, or even cholera; in fact the very diseases of India, though less severe, less rapid in their course, and less fatal. We may imagine the extent of such effects under what has been called the 'hot and copper sky' of India. Sailing up the Hoogly river to Calcutta, Bishop Heber describes parts of the shore as presenting nothing to the eye but one unbroken line

of black wood and thicket, looking as if inhabited by every dangerous animal and disgusting reptile and insect, and the very seat of fever. Of such shores every sailor has a horror, for he knows them to be the grave of those who land upon them*.

Diamond harbour, about five-and-thirty miles from Calcutta, is notorious for unhealthiness. It is here that the Company's ships are unloaded, and thousands of English sailors have perished here.

Even *much* heat is not required to bring forth from marshy places the *miasmata*, or noxious vapours, which produce some of these forms of disease. Perhaps it may be found that when these hurtful vapours are produced in a low temperature, the general effect is the production of ague, or intermittent fever; and when raised by a higher temperature, then fevers of a more continued form, and dysentery, are the consequences; at least this may be the case in our climate. At all events, these causes of disease, heat, an inundated and drying soil, very luxuriant, are found, on the banks of the Ganges, the Jumna, the Burrampooter, and all the great rivers of India. The banks of these rivers are in many places low, and of a rich soil; and the same effects are seen to arise from the same causes, modified only by a different climate, on the banks of the Scheldt in the Netherlands, and nearer home, at the mouth of the Thames itself.

Besides this state of the banks of rivers,

* Heber's Journal, vol. i. p. 6.

every one who has read of India, and of tiger-shooting, has heard of what are called *jungles*. These are vast collections of low and dense brushwood, with reeds and an exuberant growth of succulent plants. They are the resort and hiding-places of the tiger and other wild beasts, as well as snakes and other reptiles; and no less the sources of diseases more destructive than these animals. The ground is so thickly covered, that the sun never reaches it, and thus the lower plants, and those that are decaying and decayed, and countless myriads of insects, become buried in a rich, moist soil; and the air of the jungle is full of moisture, and stagnant, and seldom disturbed or renewed.

It is consoling to know, that as civilization and cultivation advance, these jungles and wild beasts become rare, and diseases become fewer. The time will come, when the tiger will be as unknown in the East as it is in England; and when that time arrives many diseases will have ceased to harass the natives of eastern countries.

Calcutta itself stands on a level and marshy ground, which, little more than a hundred years ago, was covered with jungle and with stagnant pools. Generally speaking, India is a flat country, with a most fertile soil, producing maize, rice, the sugar-cane, and the cotton-plant. There are also extensive forests in India, and as in climates between the tropics the trees are never, as with us, quite stripped of leaves, the ground is kept so

shaded and covered, as never to be well ventilated, or, except in particular situations wholly dry. The province of Bengal is three hundred miles in length, and as many in breadth, and almost without a hill. The many branches of the Ganges flow through almost every part of it; and there are innumerable tanks or ponds, the making of which is considered a religious duty, although, unfortunately, it is not considered a duty to keep them from drying up, and becoming overgrown with weeds. In the rainy season, nearly the whole country is under water, except the houses, which are built on artificial mounds: the farmers go to market in boats, and often carry their families with them, lest they should be drowned in their absence.

Many of the swamps are places which, in wet seasons, are quite covered with water, which gradually disappears in the dry season. Such a place is called a jeel. The grass grows in such places higher than a man's head. The partial and gradual drying of such swamps shows its effects on those living near them, who are often all affected with the marsh-fevers. Whole families being sick at the same time, and medical assistance not easily procured, many die for the want of it.

In sickly seasons, the tempests and tornadoes are observed to be the most frequent; and the changes in the air which produce the sickness are thought to be connected with those which produce the storms. In our country, this sickly summer and autumn of 1831, although

generally fair and beautiful, has been broken in upon by many thunder-storms, and latterly by gales of wind of unusual violence. Our storms, however, sink into insignificance when we read of the mighty storms of the Indian climate:—"The dense, moist, hazy, and close atmosphere," says Mr. Annesley, "loaded with the exhalations of putrid insects and reptiles, and of the soil and its vegetable productions, after remaining for a time still and suffocating, enervating those who are destined to breathe it, and infecting their circulating fluids, suddenly becomes kindled into the most vivid commotion, sweeping before it whatever opposes its progress, and blazing out into one ocean of flame, which seems momentarily extinguished by the torrents of rain which rush furiously to the earth, and is immediately again lighted up to its greatest brilliancy and widest extent; so that the atmosphere presents the most extensive and the most sublime conflict between fire and water which the imagination can paint, whilst the irresistible force of the winds seems to sweep both combatants from the field *."

Awful, however, as these storms are, their effects are in every way beneficial. A great and favourable change is often produced by them on everything that grows. The grass and trees, never quite dried up, become fresher and greener, new flowers spring up out of the ground, the fruits increase rapidly in size, the young grass grows as high as the knees of the half-starved cattle, and numerous birds

* Researches on the Diseases of India, vol. i. p. 73,

rejoice in the freshness of the earth and of the air. There cannot be much doubt, also, that by these violent agitations of the air the causes of pestilential diseases are often swept away.

The inconveniences to which man is exposed always call forth his ingenuity. Various means are used to keep off the heat of so oppressive a climate as that of India. One is, the setting up of mattings made of a sweet-scented grass before the open windows of the house, and employing a man to keep them wet by sprinkling water over them. The man employed for this purpose sometimes falls aleep over his work, and then such a stream of hot air enters the house as can scarcely be borne. In all hot countries, and in our own country in very hot weather, it should always be remembered that the air is not *cooling*, but *heating*, and that if the windows are closed early in the morning, the house will be cooler by many degrees than the air on the outside of it. Both the air and the light should be excluded as much as can conveniently be allowed. In an Indian house, in hot weather, the temperature of the inside, with all this care, is not less than eighty-five degrees; but without this care it rises to a hundred degrees, a heat seldom felt in our English houses in any weather. But if you step out into the air in India, impatient of your confinement, you feel, says Bishop Heber, as if approaching one of the blast-furnaces in Colebrook Dale. The insects and reptiles are as troublesome as the heat. Scorpions and musquitoes are common

nuisances. Sometimes a snake is found coiled up under the pillows of the bed. To keep out all these annoyances, many English comforts are given up. The rooms are large, and white-washed, but have very little furniture in them, and no carpets. Nor can any one walk out so freely and carelessly as in England, where we dread neither snakes nor jungle-fevers. The heat alone produces in some persons the sensation of being pricked with red-hot pins and needles.

Another contrivance is what is called a punkah, an immense fan hung from the ceiling, and moved backwards and forwards. Frequent bathing is customary; and with thin clothing, quietness, and tolerable care, the health may sometimes be preserved, even in a hot climate, better than is generally imagined.

The climate of India being so full of the seeds of disease and premature death, one would suppose that those who resolve for a time to brave all its perils for some advantage to be gained there, would most anxiously study and most scrupulously adopt all such customs with respect to food and drink, exercise and rest, clothing, occupations and amusements, as would, if not protect them from these perils, at least not add to them. But the love of indulgence is so powerful, and the force of example so much stronger than the wisest resolutions, and the power of mere habit so much beyond the control even of danger itself, that, however prudent the previous resolves may be, it seldom happens that a European, parti-

cularly one in the prime of life, refrains from falling into customs singularly ill-adapted, it would seem, for the preservation of life in any climate, and least of all adapted to do it in a climate which at once tends to debilitate the nervous system, and to kindle the vascular system, or the blood-vessels, into inflammation, particularly affecting the stomach, intestines, and liver. Such is certainly the direct influence of the climate on European constitutions; for it is to be observed that there is no climate to which the human race may not, in the course of generations, become accustomed. Even those parts of the African coast which various European countries have tried to colonize without success, each deportation of white settlers being cut off by disease, is yet inhabited by negro and other races, who enjoy health, and live to a good old age.

To say that in the climate of India it is desirable to adopt a *low* system of diet, would be, we believe, to assert what the experience of all who have been much in that climate would discountenance. Even among the natives, those of the castes in which animal food is most sparingly employed soonest sink under disease; their diseases are less inflammatory than those of the castes which take animal food with less scruple, but they are still more fatal, the powers of life seeming unequal to endure them. It is, on the other hand, to be remembered, that the majority of Europeans who go to India are in the prime of life, have been brought up in a different and

more invigorating climate, and are more disposed, on passing into tropical regions, to all inflammatory and acute affections.

The military officers in India go to parade in the morning at six. Breakfast, taken at eight or nine, is nearly the same as that to which they are accustomed in England, including coffee, tea, fish, meat, eggs, &c. Between the hour of breakfast and that of luncheon, or, as it is called in India, *tiffen*, it is a very general custom to drink frequent draughts of wine and water, beer and water, or brandy and water. The nature of the breakfast and the heat of the morning make this custom agreeable, if not necessary; and it is precisely that kind of custom which is likely to become inveterate, and by degrees to be indulged in to excess.

At one o'clock, and consequently in the full blaze of day, tiffen is served up, which is, in fact, a substantial dinner of highly-seasoned food. Mulligatawny soup, which owes its agreeableness to *curry*, (a mixture of powdered vegetable substances, of a very pungent and stimulating nature,) fish, roast and boiled meats, beer, and various wines are freely partaken of. After this heating meal, some rest on a sofa until dinner-time, but many ride out in the heat of the sun; and some, by way of promoting digestion and securing an appetite for another meal at seven or half-past seven, exert themselves at cricket or fives. There is an evening parade before dinner, and at the dinner come the soups

again—fish, rich and hot curries, and every article of a meal combining the luxuries of the East with those of Europe. Coffee or tea are usually taken before going to bed.

Those who are not in the military service lead much the same kind of life. They ride to the counting-house instead of the parade; but, like the military officer, they partake freely of meat and stimulating food and drink three times a-day, besides occasional cooling draughts of wine and water or brandy and water. A cold bath is often taken by them before breakfast.

The peculiarity of the modes of living in the East becomes more remarkable when observed in the instance of the private soldiers. They are taken from the labourers and working manufacturers of England, accustomed, for the most part, to the moderate use of ale and spirits, and, in the instance of the labourer, not accustomed to any great or habitual warmth. When carried across the sea, into climes under a burning sun, they are put at once upon a diet closely resembling that to which the higher classes of England are accustomed to in their own country. Much pleased with this change, it is not to be expected that they should exhibit great prudence or forbearance. Going out to parade, in the chill morning air, before he has had any breakfast, the soldier is very glad to drink his allowance of 'two large glasses of undiluted arrack*,' (spirits). A man is al-

* A spirit made from a coarse sugar called jaggery, procured from the juice of a species of palm-tree.

lowed a pint, and a woman half a pint of rum every morning; and they drink it without water. At dinner he is served with hotly spiced soups and curries. It need hardly be added that, in proportion to his power of doing so, he allays his thirst by repeated draughts of any liquor which can be procured at the cheapest rate.

Those who know what effect that system of diet *alone* would produce, and does produce, where it is habitually persevered in, may imagine that it greatly adds to the evil influences of a climate in which so many thousands have died. It has been accordingly observed, by physicians experienced in the diseases of India*, that the luxurious living and the indolent habits of the higher classes dispose them to serious disorders of the stomach and liver,—whilst the common soldiers, less fully fed, but with equal stimulus, more accustomed to indulge in the intoxicating drinks of the country, and more exposed to the varieties of the weather, are very liable to fevers, to dysentery, and to the acutest form of liver disease. To produce these effects, several causes concur in India, connected with the climate; but those who inhabit a temperate climate cannot live like the English residents in the East, for any length of time, without paying the penalty of great discomfort, or incurring actual and even serious disease.

Few travellers have taken much trouble to describe the food and general habits of the na-

* Annesley, Sketches, &c., vol. i. p. 207.

tives of different classes. Generally speaking, they partake sparingly of animal food, and many of them never taste it. They live much upon rice, of which a large quantity seems required for the support of a man; their rice is seasoned with different vegetable preparations of a stimulating and agreeable kind, made into what is called *curry*. They have lately become acquainted with the potato, which grows best in those parts of the country where the rice is scarcest. Corpulency is much in honour with them. The *Brahmins* religiously adhere to a diet of rice, roots, fruits, and herbs, and their only drink is water or milk.

The dresses vary much in different ranks. The lower classes wear linen round the middle of the body, and a linen covering for the head, hanging down on the shoulders; the rest of the body being exposed to the weather. Others wear a cotton shirt and trowsers; and servants wear turbans, girdles, and other distinctions. The shawls and dresses of the upper classes are very rich and splendid. The ancient dress of the Hindoos was nearly that of the lowest order of their people at present; and the turban and trowsers have been supposed to be introduced by their early conquerors, the Mahometans. Their colour is olive, or bronze, of various depths of shade; and they are commonly well proportioned. Few people have changed so little in the course of ages as the Hindoos. They are described by those who accompanied Alexander the Great in his conquests, as a delicate and slender people,

of dark complexion, with black and uncurled hair, their dresses made of cotton, and their food almost wholly consisting of vegetables. Their division into several tribes or *castes* is also mentioned, each caste having particular duties, following particular trades only, and holding little communication with the rest. Even at that time, too, they had a custom among them which the English have not yet succeeded in getting the better of,—for the widow of a Hindoo yet burns herself to death over the dead body of her husband; or, if her husband is on a journey, and reported to be dead, she will burn herself in company with some part of his dress, sometimes with his slippers. As no one among them, save persons of the lowest caste, eats of the flesh of animals which they consider sacred, (as the cow,) or drinks of intoxicating liquors, it has been very difficult for Europeans, who do both these things, to gain much influence over them. The same customs have doubtless preserved them from some of the diseases which are so fatal to Europeans in India. Their cottages are of cane-work or mud. As their dresses are not scrupulously clean at all times, it is fortunate that they are all much addicted to bathing and washing the body. Some of them will bathe in the rivers more than once in the day, and the women walk home in their wet dresses without fear of catching cold. The good effects of keeping the skin perfectly clean in a climate which causes so much perspiration, may readily be imagined; and the natives are led to do it both

because washing the body is commanded by their religion, and very agreeable to their feelings. The poorer class are destitute of almost every comfort, inhabit miserable huts, sleep on the hard floor, and live poorly: they are dependent on good seasons even for the sparing food on which they live. If the annual rains do not fall, they are ruined. Sixty years since, no fewer than three millions of the people of Bengal died of famine, and the diseases produced by famine. The rice-crops failed, and rice became exceedingly dear: the people fled to the woods, and eagerly devoured the bark of trees*, to escape death from starvation.

* Kennedy on Cholera.

CHAPTER IV.

PROGRESS OF CHOLERA IN THE EAST.

It was in such a climate, and among people of such habits, that the cholera first showed itself; and it soon became an object of common conversation and general fear. The terrified inhabitants of Jessore, where it first appeared, fled in crowds to the country; and the people on the western side of India heard of cholera as destroying its thousands on the eastern coasts, and putting a stop to all kinds of business. Every week brought them news of its advance towards themselves.

We, who talk about such things calmly, can hardly imagine what would be the real effect of such circumstances upon us. If, for instance, the cholera now prevailing at Sunderland, Newcastle, and Shields, should be said to have travelled to Darlington, or to York;—if it should be said to be coming downwards to Stamford, to Peterborough, to Cambridge; or along the coast to Whitby, to Cromer, to Yarmouth, and rapidily onwards towards London, and if the number of persons attacked was as great as when the disease first broke out at Jessore, the dismay and confusion would be indescribable. Even now, it is said that most of the medicines

recommended against cholera are eagerly bought up. The true use of fear, however, is to make wiser preparations against danger; and these will be mentioned in another chapter.

Looking at the map of Hindostan or India, the reader will find, at the head of the Bay of Bengal, the city of Calcutta, the capital of one of the three presidencies into which the government of India is divided. A little to the north-east of Calcutta, or to the right of it, and a little higher, will be found Jessore; and it was at this place that the cholera made its appearance in the month of August, 1817. Jessore is a crowded and dirty town, in the midst of marsh and jungle. It is distant about a hundred miles from Calcutta; and the disease spread from village to village, until it reached the latter place early in September. In the district of Jessore, it had carried off ten thousand persons in a few weeks. In the dirty and miserable quarters of Calcutta, among a poor and half-starved population, its ravages were most severe. In the narrow, dirty, unpaved lanes inhabited by the natives of this wealthy city, the people were attacked by hundreds, and many died in the course of very few hours. The disease spread to the vessels in the river. The crew of one came ashore to bury one of their comrades, dead of cholera; when they returned from the grave, a man, left to take care of the boat, was in convulsions, and soon died also; and the boatswain was attacked, and died soon afterwards. From Calcutta it spread itself, in

a north-west direction, through the province of Bahar or Behar, and along some of the great branches of the Ganges, the mouths of which great river discharge themselves into the Bay of Bengal, below, and to the east of Calcutta. Many large cities suffered most severely from it in its progress; and the inhabitants of some of them fled in dismay to other places. Benares, Allahabad, Cawnpoor, Lucknow, Bareilly, Agra, Delhi, all of which may be seen in the map, a little higher, and to the left of Calcutta, were among the places which suffered. The disease did not prevail in them all at once, but as it left one it appeared in another.

The disease also travelled westward of Calcutta, and reached the great army then collected in the province called the Deccan, which lies between Calcutta and Bombay, at the head of that great peninsula seen in the map of India, which ends at Cape Comorin. This army, commanded by the Marquis of Hastings, amounted to eleven thousand men, but had eighty thousand followers of the camp. The destruction effected in it was frightful. The medical men could not attend to all who required their help; and the living could not bury the numerous dead. Old and young, Europeans and natives, sunk beneath the sudden force of the malady; and the stoutest hearts were filled with fear. All business was stopt. All was silence, except where people were sick and dying. Men died whilst carrying the sick to hospitals; and those they carried died before they could be got thither. The English sol-

diers often died within six hours after the attack; and the Sepoys, or native soldiers, in three*. Sentries were seized at their posts, and those sent to relieve them were seized also. The natives fled in despair, but found all the country round strewed with dead bodies. The army was moved away, and every day left many dead behind, slain not by the sword, but by the cholera.

The cholera visited Nagpoor, and the cities of Aurungabad and Ahmednugger, and passed on to Poonah, which is seen to the south-east of Bombay†. It then got to the coast,—touched at the island of Salsette, near Bombay, and, by the second week of September, 1818, about a year from its first appearance, it was established in Bombay itself. A traveller from the province of the Deccan was supposed to bring it: he had come through Panwell, where cholera prevailed, and which is between Poonah and Bombay, and fifteen miles from the latter. In this deliberate passage, it has been already said that it paid a visit to the great army: every division, and almost every regiment, was attacked; and although it did not prolong its stay with the army longer than a fortnight, it destroyed three thousand men out of ten thousand;—some say even that it destroyed five thousand.

Thus we trace the cholera from Calcutta in

* Kennedy.

† It is usual, in maps, to make the upper part represent the north, the lower the south, the right-hand part the east, and the left the west.

a north-west and in a westerly direction; but it was also travelling at the same time eastward and southward. In a southerly direction, it passed down the whole of the coast of Coromandel, which forms the west side of the bay of Bengal. Some of the medical writers on this disease have given maps, showing the date of its arrival at each place. By a map of this sort, published by Mr. Scott, and in a smaller form by Mr. Hamilton Bell, we find the cholera at Ganjam about the middle of March, 1818. Ganjam is nineteen degrees north of the equator, or equinoctial line. In about two months more it was at Vizagapatam, two degrees nearer the equator; in one month more, at Masulipatam, two degrees nearer the equator still; in *one* month afterwards it was at Ongole, *one* degree nearer the equator; and thus it travelled at the rate of one degree of latitude of the earth's surface in a month; that is to say, about seventy miles; and in this way it reached Madras in October, 1818, and, still passing along the coast southward, went on even to Cape Comorin, the end of the peninsula. The first part of this journey of the cholera was performed in dry weather, but the last part during the rainy season, in which the rate of its progress became greater than at first, for it passed over five degrees in three months. It seems also frequently to have travelled *against* the current of violent winds.

There was occasionally something capricious in the march of cholera. Some towns

were apparently passed over for a time, and when the inhabitants were congratulating themselves on their escape, it would seem to come back, and visit them as severely as their neighbours on each side of them had been visited before. Parts of towns, or of villages or camps, sometimes escaped; and some places, though seeming to be in the very track of the disease, remained quite free from it. Now and then a single tent would be affected with cholera, and all the rest free.

The number of Europeans who suffered from the disease does not appear to have been by any means so great as that of the poor natives of India, those especially who were ill-clothed and ill-fed. It was observed, also, that of them, those who had travelled about the most, and known the most changes, did the best. Many had a great dislike to being taken to hospitals, and died for want of help: some refused all help and all medicine, although their neighbours were dying around them.

Soon after the cholera reached Madras, it passed over a hundred and fifty miles of sea to the island of Ceylon. It was supposed to be carried thither from Palamcottah, near Cape Comorin, where it spread with great severity for six months or a longer period. Of 427 men belonging to the army there stationed, who were attacked, 203 died. In a report from one surgeon, it is stated, that of fifty cases at Candy, forty ended in death.

From Ceylon, the malady was supposed to be carried to the island of Mauritius, across

twenty-five degrees of sea, or nearly two thousand miles, that island being twenty degrees *south*, and Ceylon between five and ten degrees *north* of the equator. A frigate, the *Topaze*, left Ceylon when the disease was raging there, in the autumn of 1819, and it would seem that the cholera appeared at Mauritius after the arrival of that frigate. There are very different reports of the number of persons who died of cholera at Mauritius—so different, that it is difficult to know which to believe. Governor Farquhar states that seven thousand died, but Mr. Cromblehohn says the number was as great as twenty thousand. So violent was the disease at Port Louis in that island, that healthy and robust persons were suddenly seized with it whilst walking in the streets, and died almost immediately.

As this account of cholera is addressed to unprofessional readers, it would be of little use to enter at any length into the disputes which have existed between those who believe the cholera to be capable of communication from one individual to another, and those who deny it. The measured progress of the cholera, which has been remarked when speaking of its progress to, and beyond, Madras, in which it seemed to travel about seventy miles in a month, has been one of the circumstances on which those have laid much stress, who believe the disease to depend *entirely on the air*. Another circumstance has been, its occasionally missing some towns, and as it were going round them, and then coming back and at-

tacking those towns alone. On the other side of the question, numerous instances have been brought forward in which there has been every reason to think the disease was actually communicated from one person to another, or carried by sick persons from one country to another. The case of Mauritius is exactly a case of this kind, but has been hotly disputed; one party asserting that the cholera prevailed on board the Topaze frigate, and was thus conveyed to the Mauritius; and another party denying this in the newspapers, in medical journals, and in conversation, until nobody ventured to believe it. Disputes of this kind have always existed in similar circumstances. It is very difficult to get at the truth, and the more so when people try to conceal it. The interests of ship-owners suffer from quarantine; and if quarantine can be proved unnecessary, they are considerable gainers; so that *their* side of the question is generally very strongly supported. It is also very difficult to prove, in cases where a supposed communication of the disease has taken place from one individual to another, that *all* the individuals were not exposed to a state of the atmosphere which *might* have produced the disease in every one of them. The same kind of dispute might be carried on for ever about our common fevers, or even about the scarlet fever. The truth is, there is something yet undiscovered concerning the laws of contagion, which will probably explain everything; and until such an explanation can be given, the wisest thing is, not

to quarrel about the facts, but to hear both sides, and provide against the *possible* danger of the disease being one that can be communicated from sick persons to persons in health. As far as regards the appearance of the cholera in the island of Mauritius, the simple facts are these:—They are taken from the journal of Mr. Foy, the surgeon of the *Topaze**. The *Topaze* frigate arrived at Trincomalee in the island of Ceylon, on the 5th of September, 1819, and all the sick men were sent ashore, including some cases of dysentery, of which four ended fatally in the hospital. Whilst the ship was in the harbour, two other men, one a sail-maker, the other a marine, became sick, and died on board the ship, of Indian cholera; one on the 16th, the other on the 20th of September. Others were attacked with the same disease, but recovered; a seaman had a return of the dysentery, and also died. The ship being ordered to the Mauritius, all the sick who had been sent ashore to the hospital were brought on board again, as it was thought the change of climate would do them good, very few of them having quite recovered. On the 9th of October the ship sailed from Trincomalee, with fifty-seven men on the sick-list. The cholera broke out immediately afterwards, attacking seventeen of the crew, of whom four died, including one who had been in the hospital for dysentery. When the ship reached the Mauritius, all the sick who were confined to bed, fifteen in number, were sent ashore to

* Medical Gazette, No. 207.

the hospital at Port Louis. The other sick, and those recovering from sickness, were sent on shore also, and lodged in quarters; six of the men sent to the hospital died—two of dysentery, and four of the consequences of cholera: all these six had been ill of dysentery in the hospital at Trincomalee. Of the other sick, in quarters, four died; they were recovering from the dysentery and cholera, but had a relapse of the dysentery, which carried them off.

Three weeks after the arrival of the ship at Port Louis, the Indian cholera appeared among the inhabitants, and destroyed fifty or sixty persons in a day, chiefly slaves. It immediately appeared with equal violence in other parts of the island. The ship was ordered away—others of the crew, not yet recovered, died of dysentery, but no other case of cholera occurred on board the ship, although all the other ships in the harbour were losing men by it.

Examples without number might be mentioned in which the disease has seemed to come with individuals from infected places; and almost as many examples might be given of persons secured from the disease by being carefully shut out from all communication with persons or places infected: and although it is quite true that many persons escape who are exposed to contagion, this is no more than we see in our common disorder of measles, yet no one doubts that children may catch the measles of each other. Nothing is more common than for two or three children in a

family to have the measles, and for one or two not to take them; and then, the next year, for those one or two to have them. This shows that the constitution is not always in a state to be affected by the poison of a disease.

Now there is one useful observation which a plain reader may keep in his mind throughout all the disputes about contagion—namely, that cholera, and all contagious diseases, must have a *beginning*. The *first* person affected, and somebody must be first, cannot receive it from any other person. Therefore he *must* receive it *from some other source*—most likely from a certain state of the air. *After* he has received it, suppose it to be granted that others may receive it *from him*, still no reason can be given why *some* others may not receive it *as he did*, from that *other* source. Such may be the case all the time the epidemics are spreading:—some people may be taking the disease from one another; other people from the original source in the air.

That there is something more than a mere state of air producing disease is seen in small-pox, where, though taken from the *air* by the *first* individuals, the disease may be taken by *others* from *them*. And that there is something in the cause more than mere communication from one to another is proved, first, as has been said, because the first person affected could not take it from another; and secondly, because after a time persons who have *not* had it do not even take it when exposed:—the disease, we know, does not go creeping

on in a neighbourhood for ever, which it must do if communication were everything: but disappears altogether, and for a long time, and then appears again without our being able to trace it to communication. The same is the case with the measles, with the scarlet fever, with the hooping-cough, and the same may be, and most likely is, the case with the cholera. If so, the long disputes which have taken place may be in part cleared up, and endless contention prevented.

Forty leagues, or about 100 miles, from Mauritius, is the isle of Bourbon, in possession of the French. The governor of it, hearing of the prevalence of cholera in the Mauritius, took every possible measure to prevent its introduction into his own island. But, contrary to his orders, some negro slaves were landed near the town of St. Denis, from a slave-vessel which had quitted Mauritius on the 7th of January, 1820: and in the same town of St. Denis, on the 14th of the same month of January, appeared the cholera. In consequence of the care observed by the governor to prevent the spreading of the disease, only 256 persons were attacked by it, but of these 178 died, or considerably more than half. Still, however, the loss in the isle of Bourbon was only about one in every 1500 persons; but in Mauritius it was at least one in twelve.

In like manner, if the map of Asia is referred to, the cholera may be traced from Malacca, south of the kingdom of Siam, to the

islands of Sumatra and Penang. The capital of the kingdom of Siam is called Bankok: to that city it is said to have been brought by the East India ships passing up the river, and it there destroyed 40,000 inhabitants.

In the year 1820, the cholera, still proceeding, reached China. The Chinese have a very extensive inland navigation, and taking no precautions against the disease, it spread for two or three years over almost all parts of the empire. So many people died at Pekin, the principal city, that it was necessary for the government to furnish coffins.

In the island of Java, which will be found in the map between China and the immense island called Australia, or New Holland, the cholera appeared in 1821. It passed along the coasts of the island, and ascended even the high mountains; and did not leave it until it had destroyed 102,000 people. The large island of Borneo, north of Java, was affected in the following year. In the Dutch garrison at Pontianah in this island, every individual became ill; the only person well enough to administer medicine to the rest was the Resident.

Turning again to the part of the map where Bombay is found, it is seen, on looking westward, or to the left, that the opposite country is Arabia, and that on the Arabian shore, nearly opposite Bombay, there is a town on the coast called Muscat. Between this port and Bombay there is a considerable trade: and in 1821 the cholera seemed to be carried

over the sea from Bombay, and it destroyed ten thousand persons: the bodies of the dead were towed out from the shore and sunk in the sea. The disease was most rapid in its course: some died in *ten* minutes after being attacked. It then seemed to pass up or along the Persian gulf, and at Bassora it killed eighteen thousand, of whom fourteen thousand died in a fortnight. At another town, called Busheer, where much trade is carried on with Bombay, one-sixth part of the inhabitants died. The bazaars were closed, the inhabitants fled from their houses, and the bodies of the dead were left unburied. Shiraz is situated on the south side of the Persian gulf, and its communication with Busheer soon led to its being visited with the cholera. The rich suffered here as much as the poor: the governor of the city at that time was the Prince Royal of Persia; his family was attacked and destroyed. The British Resident was Mr. Rich; he went to bed complaining of being rather ill, and the next morning he was found dead. Altogether, the deaths at Shiraz were in the first few days about ten thousand, out of a population of forty thousand.

From Bassora the cholera was supposed to be carried to Bagdad, upon the river Tigris, where it destroyed one-third of the population: it then traversed the kingdom of Persia, and it was from the seaports of that country, from Baku, or Bakoo, on the Caspian Sea, and not far from the famous mountains of Caucasus—that the disease of which so much has been

said is supposed to have been transported to Astracan, and to the Russian dominions north and west of it; where we shall see it excited equal dread, and prevailed with nearly as much fury, as in the warm regions of India, Arabia, and Persia.

CHAPTER V.

PROGRESS OF CHOLERA TOWARDS RUSSIA.

Before tracing the Cholera farther, we have seen that it seems more independent of climate, soil, and even of those habits of life to which writers on diseases of India have sometimes been inclined to ascribe its occurrence, than it was formerly believed to be. The example of the island of Ceylon may be taken in connection with this subject, even as regards countries within the tropics. Ceylon is situated very near the equator, not more than six or eight degrees from the equinoctial line, or a little more than four hundred miles, the distance from London to Edinburgh.

In consequence of the position of the earth, with relation to the sun, or, in other words, of the manner in which the earth is turned towards the sun in all its journey round it, the parts of the earth called the Poles sometimes receive no rays from the sun, no light and no warmth, for several weeks; and never, during the whole year, feel the full influence of the sun: but, during the whole year, the parts of the earth on which the equator is marked, and all the parts between the two lines on the globe marked "Tropic of Cancer" and

"Tropic of Capricorn," receive a very great share of both heat and light; our long cold nights, and our short cold days are equally unknown to them. Those countries which are nearest the equator, as for instance Ceylon itself, do not feel the varieties of our seasons: they have varieties of winds and rain at particular periods, but the trees are never bare of leaves, and the ground is never frozen; and snow is never seen. The consequence is, that in many of those countries, European people can with difficulty preserve their health or their lives; whilst on the other hand, the natives of such countries when brought to Europe experience as much inconvenience and danger. If the Englishman who goes to live within the tropics becomes liable to diseases of the stomach, liver, and bowels, the tropical inhabitants, or those born in India, who come to England become exposed to consumption, which is a disease affecting the lungs, and to all diseases caused by cold and moisture.

Several things contribute, however, to make some spots in all climates more healthy as well as more agreeable than others; and the climate and soil of Ceylon are less of a nature to dispose to disease than are those of the great continent of India; and much less than the great continent of Africa. The parts of the island exposed to the hottest winds are drier, and those parts exposed to cooler winds are kept in a state of greater freshness than is at all common on the continent of

India; the climate being thus rendered more equal during the year. The low wooded parts of the island towards the sea are the only parts that are considered unhealthy; and this particularly in the dry season. Yet at Ceylon the cholera prevailed no less than in Bengal. And when it spread itself up the great branches of the Ganges, and other Indian rivers, it raged in every city, whatever its position or its soil: no less at Allababad, a city standing on a three-cornered spot of ground, where two great rivers, the Gunga and the Jumna, join, and built on a particularly dry and healthy soil, than at Calcutta, which is, as has been said, founded on nothing better than a marsh.

It has also been remarked by writers on the cholera that the heat of countries between the tropics, and the other circumstances of their climate and soil are pretty nearly the same at all times, yet that the disease does not prevail, or at least has not prevailed at all times. The experience of cholera, indeed, since the year 1817, has proved that it may spread in very various climates, cold as well as hot, and on high grounds as well as in low swampy places. We shall presently see that although introduced into Russia in the hot season, it spread greatly in November, when the thermometer was far lower than we know it to be in our English winter,—lower than the freezing point, lower by sixteen degrees than any point marked on our thermometers,—and continued to prevail during the whole winter:—so that it is quite in vain

to expect cold weather to put a stop to the cholera.

Notwithstanding these remarks, however, it must never be forgotten that *it began* in India, and that in hot countries it has been most fatal in hot seasons. Some observers have thought that the great heat of the houses in Russia, kept warm by stoves, made the malady more prevalent than it would otherwise have been in that cold climate. In its passage, also, to Russia, the places which it visited were many of them certainly, and probably all of them, the most favourable for its invitation and for spreading it. As it proceeded through Georgia, for instance, it appeared at Tifflis, from whence the fear of it did but precede its course into Russia. The heat of Tifflis in the summer is described as intolerable, the thermometer being occasionally as high as 118 degrees of Fahrenheit in the shade. The streets are very narrow; the houses have no glazed windows; the public markets, the baths, the river, and indeed the whole town, are in the utmost degree dirty and offensive. It is situated between a muddy river and a high mountain, amidst parched fields and barren hills.

Jessore, where the cholera *first* appeared in 1817, is crowded, dirty, badly ventilated, and in the midst of marsh and jungle. The poor people of Calcutta are badly fed and miserably lodged, exposed to heat by day, and to bad air by night in close and wretched hovels, round which there is often much stagnant and offensive water.

Again, it strikes the observation, that in its progress from the warm climate of India to the cold climate of Russia, it has not only *clung* as it were to the people in the great commercial thoroughfares, but has come, step by step, through countries in all of which some forms of disease are known to prevail which medical men with one consent ascribe to dirty habits, or to poor living, or to wretched habitations, or other causes which care and good policy might change for the better. Among the diseases of this class may be mentioned the Guinea-worm, as it is called from its principal prevalence in Africa, but which is common in some parts of Persia,—a disease supposed to arise from drinking the water of particular wells, and consisting of the appearance of a small and troublesome worm under the skin, which, however, often gets there *through* the skin itself. Then, in the north of Europe, we meet with a very curious disease of the hair, most common in Poland, but also seen in Russia and other countries, in which the hair becomes matted together into a mass of the most offensive and horrible description. The Poles of a certain class, who are so often affected by it that it is called the Plica Polonica, allow their hair to grow as it pleases, never cutting, combing, or washing it, and generally wearing a leather or warm woollen cap. People of this sort must be well prepared, by dirt and negligence of every conceivable kind, to receive and to communicate any violent and contagious disorder.

It was remarked in a former page, that as

civilization advanced, the wild beasts and reptiles of the forest and jungle would gradually disappear. It may be added, with perfect truth, that many diseases arising from the jungle and forest would disappear also. But there are numerous other disorders which cleanliness alone will utterly banish from cities and the habitations of men. Dirt and ignorance, dirt and superstition, dirt and slavery, generally go together, and what tends to remove the wretched slavery, or miserable superstition, or deplorable ignorance of the Eastern and other parts of the world, will tend also to cleanse and purify their cities; and then some of the diseases which now terrify mankind will be heard of no more.

Reflecting on these things, it requires only the plainest understanding to see that it is intended that man should go on improving; and that he cannot improve in any one way without a tendency to improve in every other way. It may as readily be seen how widely the benefits of useful knowledge really extend; for just in proportion to the diffusion of such knowledge there is a spread and increase of all the decent comforts of life, and a freedom gained over sickness and destructive disease.

Let us just consider the condition of one of the great cities of India to which the cholera very soon spread itself from Jessore—the city of Benares, for example, in the province of Behar, to the north and west of Calcutta. The population is about half a million: it

is a city of great trade; from the south of India diamonds are brought thither, muslins from the east, and shawls from the north, for sale: there are manufactories of silk, cotton, and fine woollen; and it is a great mart for English hardware, and other goods from Europe. It is well drained, and stands on a high and rocky bank sloping down to the river; but most closely built, and crowded with beggars and vagabonds. So narrow and so winding are the streets, that no wheel-carriage can pass through them; and the houses rise to a considerable height, and have many projecting verandas, windows, and galleries, and broad and overhanging eaves like the oldest streets of London, of which very few are now to be seen. Narrow as the streets are, and hardly wide enough to allow the proper circulation of air, they are also crowded in every part. *Sacred* bulls, as tame and familiar as dogs, walk lazily up and down, or lie about in the streets; and *sacred* monkeys are clinging to every roof, projection, and ornament, putting their heads and paws, without scruple, into every shop containing good things, and even taking food out of the hands of the little children. At the same time, both sides of the street are lined with beggars, most of them deformed, and covered with chalk and cow-dung; and many of them preserving particular attitudes by way of penance—some walking on one leg, never using the other, which has become contracted for want of use; some holding out an arm in a painful position;

and some clenching their fists until the nails have grown through to the backs of their hands. Hundreds and thousands of these idle and dirty and useless people resort to Benares. And all this crowding of cattle and of men little better than cattle, and all this filth and want of ventilation, it is to be remembered, is beneath an Indian sun, the power of which far exceeds that of the very hottest days of July in England.

When the cholera came to such a place as Benares, we may imagine how well prepared it found the people to be attacked by it. Generally speaking, the townspeople are temperate, and much in the habit of washing themselves in the river; without which it is probable that the whole city would have been made desolate.

Some pages back, when speaking of the contagion of different diseases, it was observed that they must have a *beginning*, and that if people had not forgotten this some disputes about their *always* being communicated from one person to another might have been spared. Another remark, which if it had been always kept in mind would also have spared some disputes, may be made here:—namely, that most or all of the contagious diseases are *only contagious in certain circumstances*. A fever, which would not spread in a clean and comfortable house, will attack the whole family in a close and dirty cottage. A fever which would not spread in a village, will destroy hundreds of people in the narrow streets of an

old neglected town: the very air seems to become poisoned, and everybody falls sick. In one case the disease seems to spread from one to another for months: in the other, two or three are attacked, and the rest escape.

Now if such cities as Benares, and indeed all dirty, crowded, ill-ventilated cities, whether in Asia or in Europe, were made cleaner, and purer, and cleared of idle, useless, and filthy persons—and if, at the same time, all the unwholesome spots of ground, jungle and jeel, and wild forest and marsh, were brought under proper cultivation,—many of the diseases which vex and destroy mankind would be put an end to; or if still heard of, would but attack a few persons, and seldom spread from city to city, destroying hundreds and thousands of people. The small-pox first came to Europe from the crowded and dirty cities of China; just as the cholera came from Bengal. And perhaps it may be said that if the people of Sunderland had not been, in some parts of the town at least, notoriously negligent of cleanliness, and of improvident and intemperate habits, the cholera itself would possibly never have found a footing on English ground. What is of importance to one town is of importance to all towns. Whilst *any* are ignorant and neglected, *all* must be exposed to danger. Knowledge and industry and cleanliness even change, not only the constitution of man, but the very nature of the air which he breathes.

CHAPTER VI.

THE CHOLERA IN RUSSIA.

THE cholera, then, is neither confined to India, nor to regions within the tropics; nor even to what are called the warm countries of the temperate regions:—nay, avoiding as it were the warmer countries of the south of Europe, Italy, Spain, France,—it has been introduced into countries more northward, and has shown that even in the climate of Russia its activity is not less than within a few degrees of the equator.

The poison of the disease, travelling along the shores of the sea, or of navigable lakes and rivers, or pursuing the track of commerce, or haunting communities of men, (either sailing in the atmosphere, out of the influence of the winds, which sweep with violence across the earth's surface, or carried by the agency of human beings, or in both ways inflicted on its victims, which is the most probable,) seemed at length to be introduced by means of a vessel which came from the port of Baku, or Bakoo, on the west coast of the Caspian Sea, to Astrachan, a Russian port at the mouth of the river Volga, on the northern coast of the Caspian. At Astrachan, how-

ever introduced, it certainly made its appearance on the 20th of July 1830; and it did not appear in any part of the Russian territory between that port and Baku. Eight of the crew of the ship from Baku had died of the cholera on the voyage. No sooner had it appeared at Astrachan than the alarmed people of the place took to flight in great numbers, going up the river; and then all the towns along the course of the Volga were successively attacked with cholera. In a map, showing the progress of the disease up the river, it is seen to have been at Tzaritzen on the 6th of August; at Doubouka and Saratoff, two towns farther on, on the 7th; and so on, from town to town along the river, up to Yarosloff on the 6th of September; thus reaching the very interior of the Russian empire, in about 58° of north latitude, 80 degrees of latitude, or more than 5000 miles, north of the islands of Mauritius and Bourbon. The first persons who died, in all these places, were either sailors, or persons who had come from infected places.

As the disease seemed to be conveyed *up* the Volga by persons infected, so it seemed to be carried *down* the next river, the Don, in the same manner. On the banks of the Don are found the Cossacks, a half-savage race of people.

A Cossack was sent from Katchalinskara (the Russian towns have very hard names) on the Don, to Doubouka on the Volga, to buy provisions: this was in the beginning of

August; and he died of cholera after his return. After that circumstance, the disease appeared first at one town on the Don and then at another, just as it had done in towns on the Volga, only going the other way; till, on the 9th of September, it had got as far down as Jagaurog, where the Don runs into the Caspian Sea.

From Saratoff, on the Volga, a town already mentioned, the disease went with the flying inhabitants to Peusa. A student also left Saratoff with a servant; his servant died on the road to Moscow, and the student himself is supposed to have been the first person who died of the cholera in the city of Moscow itself. The malady had come so rapidly on the town of Saratoff that the people had no time to take any precautions; there was scarcely a family in it which had not to lament a death. All the four surgeons of the place were very soon attacked with it, and three of them died. All who could run away left the place: a clergyman's congregation was reduced from five hundred and fifty to one hundred and fifty. At first, the deaths were only four a day; they gradually increased to five, twelve, twenty, eighty, and at last up to two hundred and sixty in a day, and then in the same gradual manner began every day to be fewer and fewer. And it is very well worthy of being remembered, that a colony of Moravians in the middle of the town, being most strictly guarded by quarantine, escaped the disease altogether.

Many instances of this kind are related as having been known in other places. When the cholera was at Aleppo, on the eastern shore of the Mediterranean Sea, the French consul invited *all* the resident Christians to his country house. They lived in the garden, round which there was a high wall; and although there were about two hundred of them, none had the cholera. Even in the Mauritius, already spoken of, one gentleman protected his family from taking cholera by shutting them up closely, and cutting off all communication with others. In some cases, when thousands have been dying in a sea-port, the crews of vessels not allowed to go ashore, or to admit persons from the shore, have remained healthy. Many gardens, and many farms were protected in the same way in Russia. Egypt is supposed to have been saved from the cholera for some time by the strict regulations of its government. But in Hungary, where all such regulations were despised, one hundred thousand people were swept away by the cholera.

The people of Moscow had heard, without much concern, of the progress of cholera on the frontiers of the great empire of Russia bordering on Persia. But when they found that it spread from Tabris, the seat of the Persian government, to Tefflis, the capital of Georgia, and from Georgia to Astrachan, and then up the Volga, they began to think the matter of more consequence. When it first came to Moscow, it particularly affected the poor, the ill-fed, the badly clothed, those living in low

and damp houses or cellars, and those who were intemperate or who led irregular lives. When it had prevailed in the city one month, there were reported to be one thousand and sixty-six persons sick of cholera, and on the day this report was made (the 26th October) two hundred and forty-four were seized with the disease. After that, the daily number attacked became every day less. On the 17th of November, 1830, the public account was this :—

Number affected with cholera from the first appearance of the complaint		6531
Recovered	1813	
Dead	3508	
Remained sick	1210	
	6531	

It does not appear from these statements of the cholera of Moscow, that it differed, either in its symptoms or its degree of danger, in the coldest weather of a Russian winter, from its character in the summer season in India. It began with general uneasiness, and with oppression at the stomach ; pain in the head was felt, and giddiness ; then followed nausea or vomiting, and purging and weakness. It often happened that the poor neglected these symptoms, or had no advice for some hours : in such cases the pulse had nearly failed before the physician saw them. Spasms of the toes, feet, legs and arms, were frequent ; the surface was cold, the eyes were sunk, the bulk of the body appeared diminished, the extremities were livid ; the tongue was pale, or slightly blue, and had a

covering of mucus; it also felt cold to the touch, giving the sensation felt on "touching the back of a frog*." The patient either died in a few hours, or lingered for many hours without pulse, yet able to converse. Some were so violently attacked as to be like persons "brought to the ground by a violent blow or a stroke of lightning." The matter vomited was, at first, what had been taken; then mucus and bile; and then watery fluid, like whey, or a thin decoction of barley or rice. Those who recovered did so with the feverish or inflammatory symptoms already described as observed in the cholera in India. Congestion in the blood-vessels of the head and eyes was often observed also in the fatal cases. The appearances after death were as nearly as possible the same. Some alteration in the thickness of the membranes covering the brain, and a fulness of the vessels of the brain, and of the spinal marrow and nerves, were occasionally observed. The lungs and the heart were gorged with blood; and the aorta and other arteries contained dark-coloured blood, the colour of the darkest cherry. The same partial contractions of the stomach and bowels, the same kind of fluid matter in those cavities, and occasionally the same marks of inflammation in them, made the resemblance exact: and the appearance of the liver, the pancreas, the spleen, the kidneys, the bladder, was precisely the same as in the Indian cholera.

The connection of the cholera with diarrhœa,

* Dr. Keir's Report.

or looseness of the bowels, and with the common bilious cholera, appears from Dr. Keir's report of cases in which an ordinary diarrhœa, arising during the epidemic, often became by neglect a true case of cholera; and of other cases in which persons about the hospitals had nausea, vomiting, and bilious diarrhœa. The importance of this, in relation to the appearance and character of cholera in England, will be referred to again.

The Russian dominions were invaded with cholera from more quarters than one. At Orengburg, on the boundary of Siberia, it was supposed to appear in consequence of the arrival of the *caravans* which come thither every year, consisting of a train of three or four thousand camels employed to bring the produce of China, India, and other countries of the East overland, and accompanied with numerous traders. At Nijni Novogorod, the disease appeared just after the great fair in 1830, at which it is said not fewer than one hundred thousand people engaged in trade and commerce had attended. The fair is held annually, but was in the year 1831, we believe, postponed, in consequence of the cholera still lingering there.

The newspapers have lately stated as a curious fact that no Jews are among the sufferers from cholera. Instead of inquiring into the truth of this, people have tried to account for it, and some have supposed the safety of the Jews to arise from their not eating pork. But Dr. Rehmann of Petersburg, (who has

since fallen himself a victim to cholera,) states that the disease was *particularly dangerous* to the Jews of that country, who live in small rooms, and in extreme filth. In the small town of Redislscheft, of eight hundred sick, seven hundred died in one week *.

A clergyman at Saratoff gives a very striking picture of his own situation and that of his flock during the time the cholera was in that city. One Sunday, when the disease was spreading fast, he preached, he says, from the text "And he looked on the city and wept" —and his congregation wept with the good man, when they thought of their danger and that of their children. All the desire of this excellent man seems to have been that his life might be spared for the sake of assisting those more helpless than himself. He was called one day at noon to his old sexton, who was suffering from vomiting and frightful spasms; and, chiefly by his care, the old man recovered. Many others died, and all in twelve or twenty-four hours from the time when they were attacked. They had, he says, the usual symptoms, with dreadful cramps. "The hands and feet were cold and blue, cold sweat flowed in streams, and the pressure of death was felt on their chests. The thirst was intolerable, and caused insufferable agony in the mouth and throat." Sometimes, in the houses of the poor, he found the wife lying on straw, and the husband on hay, near her, and both ill of cholera. When one day going to bury four

* Hawkins on Cholera, Appendix, No. vi.

corpses, he met sixty funerals. Such dreadful effects of the disease, it is to be hoped, will never be known in England. Worse effects, however, *have* been known, when the plague prevailed; and if we are right in attributing the banishment of this disease from London to the paving and draining of the streets, and the cleanliness of the houses, and the greater comfort of all classes since they have become better informed than they were, we are only the more bound to consider whether there are not yet in London, and in all large towns, some remains of the old neglect which yet nurse and heighten our fevers, and *may* prepare the way for so sudden and so deadly a malady as the cholera itself.

It was at the end of May last that the cholera appeared on the shores of the Baltic sea. In the map of Europe, not far from Memel, will be seen Polangen, where cholera made its appearance May 24th. On the 25th it was observed at Riga, farther north. In the same month cholera appeared at Dantzic also, south of Polangen; and in about a month there had been 3,200 people attacked there, of whom 1,480 had died, or nearly half: the disease was then beginning to be milder, although the imprudences of the people in eating and drinking about Whitsuntide had rather increased the number of cases at that time. In May the cholera appeared as far north as Archangel, and in August and September as far south as Berlin and Vienna.

Thus we see the same disease, long con-

sidered to be like certain plants, confined to a certain climate, capable, like them, of being transported to climates utterly different, and flourishing there just as it did before. The cholera has done this in the most striking manner. No greater contrast of climate can exist than that afforded by Hindostan and Russia.

Of Russia, as of India, it must be observed, that the extent of the country is too great to make any general description exactly applicable. It extends from the 38th to the 78th degree of north latitude; that is to say, nearly 3,000 miles from north to south: its territories commence on the limits of China in the south, and only end at the Arctic sea on the north; whilst they stretch eastward from Prussia and Poland to the Pacific ocean. The empire of Russia, therefore, is spread over no small portion of Europe and of Asia: of 345,000 geographical square miles, 85,000 are in our quarter of the globe, and 260,000 in Asia. In the dominions of the Emperor of Russia it is commonly said that "the sun never sets."

The extent of Russian territory being so considerable, it may well be supposed to comprehend every variety of climate, and people of habits exceedingly various. Dry and healthy plains, and vast marshes, and immense forests, and extensive lakes, and numerous rivers, are the characteristic features of different portions of the empire. Among the latter, the Volga, so often mentioned already—its banks having been first visited by cholera,—

divides, in a great part of its course, Europe from Asia.

Astrachan, where the cholera first presented itself, is seated on an island at the mouth of the river Volga, and is a port of great trade, with a population of about 20,000 people, and doubtless abounding, as all sea-ports do, with crowded, ill-ventilated, and dirty houses, and a negligent class of poor inhabitants. The banks of the Don, the river *down* the course of which the cholera travelled, after travelling *up* the course of the Volga, are fertile in plants, and in many places covered with extensive low woods; and marshy places seem to be very common. The water-melon is much cultivated, and covers many acres of ground. There are also large uncultivated plains, called *stéppes* in Russia, resembling the *prairies* of America, capable of tillage, but untilled: these are bleak and desolate in winter, but covered with herbage and flowers in summer, like a vast and wild meadow; the grass is never mown or meddled with, but is allowed to grow and to decay—thus creating a kind of soil which if acted upon by equal heat, or liable to inundation, would in several respects resemble that of the banks of the rivers in India. One of these plains, above the Sea of Azof, into which the Don runs, is above 400 miles in length. On the eastern and western sides of the Don, near its mouth, there are marshes of great extent, which are liable to an annual inundation; numerous aquatic plants, and all the flies and insects

abounding in marshy and drying ground exist there in great numbers; and all this part of the country is very unhealthy.

The *Don Cossacks* who were seen in the south of Europe not many years ago, inhabit the banks of this river. They are a wild military race, unskilled in many of the arts of peace; but, when not engaged in war, living chiefly by fishing, their wealth being their horses and their cattle.

The city of Moscow, associated in the mind of every reader with the fatal retreat which the French army was compelled to make from it in the commencement of the winter of 1812, was greatly improved by the conflagration which made that retreat necessary. Before that period it was one of the most singular cities in Europe; of immense size, with long and broad streets, some paved, some formed of the trunks of trees, and some boarded like a floor. There were many palaces, and close to them the most miserable cottages; and whilst some parts of the town were like a splendid capital, others were like a village, and others like a desert. The Prince de Ligne said of it, that it looked "exactly as if three or four hundred great old *chateaus* had come to live together, each bringing along with it its own little attendant village of thatched cottages." Dr. Clarke gives a striking description of it. "Numerous spires," says he, "glittering with gold, amidst burnished domes and painted palaces, appear in the midst of an open plain, for several versts before you reach the Peters-

burg gate. Having passed, you look about and wonder what has become of the city, or where you are; and are ready to ask once more, How far is it to Moscow? They will tell you, This is Moscow. And you behold nothing but a wide and scattered suburb,—huts, gardens, pig-sties, brick walls, churches, dung-hills, palaces, timber-yards, warehouses, and a refuse, as it were, of materials sufficient to stock an empire with miserable towns and miserable villages." "Having heard accounts of the immense population of Moscow, you wander through deserted streets. Passing suddenly towards the quarter where the shops are situated, you might walk upon the heads of thousands. The daily throng there is so immense, that, unable to force a passage through it, or assign any motive that might convene such a multitude, you ask the cause, and are told that it is always the same."

This is a description of the city before the invasion of the French. A large portion of Moscow was then utterly destroyed by fire, by the Russians themselves, in order that the city might neither afford food or shelter to their invaders in the rigour of winter; and some of the public buildings were blown into the air by the French before they abandoned the smoking and ruined city. New buildings have since been raised, and great improvements effected, although the extent of the population, amounting to about 300,000, the poverty of the lower classes, and the nature of their wooden habitations, together with their usual

dresses, are such as to prepare them for the severest visitations of any epidemic disorders that become introduced among them; and the plague, which has often prevailed there, has devastated it more lately than any city in the same latitude.

The dress of the poorer classes of the inhabitants of Moscow is very nearly that of the peasantry in general, and consists of sheepskins, the wool being worn next the body. The warmth of such a dress may be very comfortable; but it is not likely to be kept very clean. A more particular account, however, both of the dress of the Russians, and of the Russian climate, will be given when speaking of St. Petersburg, the capital of the empire.

It is worthy of observation, that those who have visited Calcutta after becoming acquainted with Moscow, have described themselves as continually forgetting at first that they were not still among the Russians, such is the resemblance of some parts of Calcutta to Moscow; where the same kind of palaces, the same description of miserable huts, and many similar customs, derived perhaps both by the Russians and the Hindoos from countries lying between both countries, very strikingly attract a stranger's notice. That, making allowance for great difference of climate, many similar causes of disease are to be found in both cities, is equally true; and is a truth not without interest to those who study the causes of disease with a view to limiting the dominion of sickness and misery.

CHAPTER VII.

THE CHOLERA AT ST. PETERSBURG

On Sunday the 26th of June, 1831, the cholera was first observed at St. Petersburg. Two English physicians, who had been sent to Russia by the English government to obtain information concerning the actual nature of the malady prevailing in Russia, namely Dr. Russell and Dr. Barry, arrived at St. Petersburg three days afterwards. Dr. Russell had been in India, and knew the symptoms of the Asiatic cholera, which, after a careful examination of the Russian disease, he declared the latter exactly to resemble. Dr. Barry was at Gibraltar during the prevalence of the yellow fever about two years since, and is a physician of much knowledge and experience; so that much advantage has been derived from the testimony and descriptions given by two such able witnesses.

Immediately after their arrival, they were allowed opportunities by Sir James Wylie, an English physician at the head of the medical department of the Russian army, to see eight cases in the military hospitals; of these, one ended fatally in seven hours, and another in sixteen hours after admission. They saw, in fact, every case that had yet occurred in St.

Petersburg, except the first, that patient having died early in the day of their arrival. Dr. Barry reports that when Dr. Russell saw these cases, he exclaimed, after the first glance, "this is the genuine disease;" and pointed out to them some remarkable features of it;—the cold tongue, like a piece of dead flesh; the tone of the voice, resembling the efforts of persons who had lost their voices; and the dim and sunken eye.

Dr. Barry, who had never seen the Indian cholera, but was very familiar with the diseases of almost every other climate, was much struck with the violent character of the malady, exhibited as it was in the young and strong men who were attacked, and who were grenadiers of the Emperor's guards. He could not help observing the leaden look and purple colour of the face, of the hands, and of the feet; the shrunken features, and the shrivelled fingers and toes. He remarked, too, the short, hurried, anxious respiration; the corpse-like appearance of the whole body, and the rending spasms of the limbs and belly. He describes the increasing restlessness of the miserable sufferers; their moaning, like the low whine of a dog poisoned with arsenic; their fruitless efforts to vomit, "resembling a deep, short, convulsive bark, in which air alone seemed to be violently expelled from the stomach:" and he notices the colourless and watery character of the evacuations which have already been mentioned in the description of the cholera of the East Indies and of Moscow.

The further experience of Drs. Russell and

Barry fully confirmed their first decision respecting the nature of the disease. Within six days after their arrival at St. Petersburg, they witnessed fifty-seven cases, out of upwards of two hundred and sixty which had then occurred. Finding that the malady was spreading rapidly, they determined to remain on the spot, instead of proceeding to Riga, which was their first intention. At that time, about the 5th of July, there was a solemn fast observed at St. Petersburg, and the streets were filled with processions and crowds of people; the churches also were filled all day long. These solemn fasts are commonly followed by much indulgence and intemperance, such as might with reason be expected to make the malady more violent.

On the 6th of July, between eighty and one hundred cases had taken place among the soldiers, and about four hundred among the rest of the population; and up to that time almost all the patients had been of the poorest classes: those amongst the classes enabled to live better were chiefly weak persons, or persons given to intemperance.

A temporary hospital was fitted up for the patients affected with cholera. On the first morning visit which Drs. Russell and Barry made to this hospital, there were only three patients: when they went to the hospital again in the evening of the same day there were no fewer than thirty-two; and all of the cases were very severe.

If the cholera should visit the city of London, it is to be hoped that the people will not show themselves to be so utterly without understand-

ing as some of the common people of St. Petersburg. They believed that the medical men of foreign countries, and all strangers, were employed by the enemies of Russia to poison the people! In consequence of this most absurd notion, Drs. Russell and Barry could not get permission to attend to any of the poor soldiers who were sick of cholera. They wished to learn what could be done by the best care and attention they could give; for so many people were sick at the same time that it was very difficult to obtain medical attendance for all of them. Every day such numbers of sick were brought to the hospitals that the medical men were employed from morning to night. Yet when Drs. Russell and Barry were desirous of giving help to those who wanted it, it was absolutely refused, because the people thought they meant to poison them!

The Emperor of Russia, seeing these things, exerted himself in a most praiseworthy manner to remove the ignorance which was the cause of them. He spoke to the people in the street, and explained to them that instead of looking with suspicion upon the medical men, they ought to be grateful to them, as to men who were risking their own lives to relieve the sufferings of the sick. Before this, the people had been so ferocious as to ill-treat several of the physicians, and one physician, a German, had been *killed* by the mob. But when the people became better informed, they began to beg for the assistance of those against whom they had been so violent before. They might, one would think, have got

rid of their foolish belief before, for fifteen hospital physicians were attacked with cholera in the first three weeks, and of these six had lost their lives. Up to that time (July 15), 5367 persons had been attacked with cholera at St. Petersburg, of whom more than 2500 had died.

In the description given of the cholera at St. Petersburg, there is so great a resemblance to that of the Indian cholera, and the cholera at Moscow, that it is unnecessary to repeat the particulars. The evacuations, both by vomiting and purging, were less profuse than in India, and recovery from the cold *blue* stage was more frequent; but there were the same spasms, thirst, restlessness, agony referred to the stomach and chest, and difficult breathing. When such a state had lasted even *four* hours, very few recovered. When any pulse could be felt at the wrist, however small, even like a small thread, there was some hope.

This cold or blue stage, after lasting for some hours, perhaps twelve or twenty-four, gave way to a stage of the disease in which the heat of the body returned, and the patient had all the symptoms of a fever,—just as we have seen was the case in India; and the fever was often as dangerous as the first attack of cholera had been. In Russia more people died in this second stage than in India.

Recoveries, as in India, were often rapid; and relapses, or returns of the disease, were not common, except in those employed about the hospitals.

The cholera had been expected at St. Peters-

burg, and preparations had been made against it, long before it arrived: but the experience of this and of several other cities has shown that the most careful preparation is seldom sufficient to secure any large place wholly from its visits, although much may be done to abolish causes which would make its severity greater and its visits longer. The precautions and restrictions adopted on the river Volga were, as usually happens, not strictly attended to; but temporary hospitals and receiving-houses were prepared, inspectors were appointed in every quarter of the city, and orders given that every case at all resembling the cholera should be immediately made known to the public authorities by the medical man who should happen to be called in.

Two cases of this kind occurred at length, and nearly at the same time. Both were in the same part of the city, on its eastern side, where the boats coming down the river from places already infected were stationed. One of the patients was a merchant, the other a painter and an habitual drunkard. They were both brought to the same receiving-house, and both declared to have the cholera. The merchant recovered; but the painter died. The third patient was an invalid soldier, employed as a watchman in the same neighbourhood; and he also died. The fourth case was that of a billiard-marker, who had a few days before arrived from Yaraslav, where the cholera was known to be prevailing when he came away.

These cases were observed about the end of June, when, after mild and agreeable weather,

the heat was considerable, with easterly winds. Although they could not all be distinctly traced to contagion, their appearance in one quarter of the town, and that quarter the nearest to the parts of the country where cholera was known to prevail, excited a natural suspicion of their arising from such a cause. But, as happens in all cases in which attempts are made to trace every case of a communicable disease to actual communication, facts which at first sight appear to be of a most opposite and contradictory nature were met with on every side.

In the *City Prison* of St. Petersburg the strictest regulations were enforced to prevent the admission of persons without a medical examination; rooms were set apart for cholera cases, if any should occur, and nurses and attendants appointed to wait upon them. A woman being ill, *not* of cholera, or anything resembling it, had been sent out for her health, even some weeks before the cholera had appeared in the city. She returned to the prison after the cholera *had* appeared in the city, and at the time of her return was suffering from diarrhœa. As she passed into the prison, she stopped and embraced her husband for a moment, who was also a prisoner. In a few hours afterwards, this woman was seized with cholera, and she died the same night. The next cases of cholera in the prison were those of three women in the same room with her: all the three died within three days after the first woman. After these women the next prisoner attacked was the husband of the first woman, who was confined in a dif-

ferent part of the prison. After him, others in the same room with *him* were attacked; and thus the disease went on, until twenty-seven persons were attacked, of whom fifteen died; and of all these twenty-seven there was only one to whom the communication of the disease from one of the rest could not be traced.

If instances of this kind stood alone, the question of contagion would soon be satisfactorily settled; but numerous instances are mentioned of persons having the cholera who had not had any communication with those previously affected; and in instances as numerous, persons have been fully exposed to communication with cholera patients without taking the disease. It must be repeated, that precisely the same kind of evidence may be collected concerning our common fevers; and for the same reason. Some take the disease from the air, some from communication with those already affected; but in both cases the persons who take the disease must be in some way prepared for the seeds of the malady, or what is called in medical language *predisposed* to receive it.

All the examples, both for and against contagion, seem to have been most diligently and fairly inquired into by Doctors Russell and Barry, and the conclusion they came to was, that from the progress of the cholera in the north of Europe; from its first appearance in the towns and villages of Russia having generally, if not always, taken place after the arrival of persons from infected places; and from the manner in which it broke out at St. Petersburg;

there was no other way of accounting for its so doing than by supposing that it had been brought by persons in the boats coming down the river from places on the river Volga, where the cholera already existed.

Several things rendered the people of St. Petersburg liable or predisposed to take the disease: such as the coarse and sour food of the common people; the long religious fasts, followed by excess in eating and drinking; the thick sheepskin clothing of the peasants, worn even in summer; and the very heated apartments of all ranks, in which every cranny and crevice that might admit fresh air is carefully closed.

St. Petersburg is built partly upon islands at the mouth of the river Neva, and partly on the two sides of that river. Its situation is low, and although the city abounds in wide and handsome streets, they are generally damp.

The soil in the neighbourhood is poor and unproductive. Parts of the city are intersected by canals, some of which are muddy and offensive. During the prevalence of winds from the west or south-west, the waters of the Neva do not so readily flow into the Gulf of Finland as to prevent a great portion of the city from being inundated. The foundations of the newest buildings have been raised to avoid this inconvenience; but so lately as seven years since, in the month of November 1824, a dreadful occurrence of this kind took place. The whole city was inundated. As the waters gained upon the streets, the carriages hurried through them, with the water above the wheels, to the higher

spots of ground; and persons on foot were up to the middle in it; and soon, only a solitary horseman was seen now and then, who could with difficulty keep his horse's head above water. In a few days all the streets were full of water, and furniture of different kinds, bread and other provisions, empty boats, sentry-boxes, and timber, were seen floating upon it; and even wooden houses, the occupiers of which had been drowned in the flood. Coffins were washed out of the newly made graves, and dead bodies floated down the stream. The least eminence, the columns and pillars, and the trees, were crowded with persons who were only saved by boats. The wooden barracks in which a regiment of dragoons was quartered were swept away; and the poor soldiers, who had climbed upon the roof for safety, all lost their lives together. A lady was in a carriage with one of her children, and the carriage got into deep water: a cossack who was riding his horse through the stream saw her dangerous situation, and stopped close to the carriage: the lady begged him to save her child at all hazards; and the poor fellow, willing to do so, took it from the carriage window. In a few minutes his horse slipped and fell, and both the cossack and the child perished: the grief of the unhappy mother was but short, for in a few minutes afterwards her carriage, her horses, her servants, and herself, were all swept away by the resistless flood.

It was ascertained that not fewer that eight thousand persons lost their lives in this inundation; but its after consequences on the comfort

and health of the poorest of the inhabitants were hardly less deplorable. Many had lost all their little property; all the provisions in the city were damaged; and as the frost had set in very severely there was little hope of receiving any supply by sea. Famine, and all the evils which famine brings, were felt by the poor inhabitants, a great number of whom were left without even a hut to lie down in.

It was the desire of Peter the Great, who founded the city of St. Petersburg, and of whom an account is given in the 'Pursuit of Knowledge under Difficulties,' vol. ii. p. 22, that his new city should in every respect rival the finest cities of Europe; but its low situation, and the great severity of its climate, were obstacles which he either overlooked or could not overcome. Those who have attended to the weather there say that on an average of ten years there are not quite one hundred bright days in a year, that at least one hundred are rainy, and about seventy snowy, and ninety more unsettled and changeable. They have also frequent and violent storms. In their winter season they have most severe frost, but the air is dry and bracing, and the houses are kept extremely warm. The frost begins in October, and ends in April. When the frost quite disappears, the changes of the season of spring are brought about very rapidly, and the fields look green, and the trees put out their leaves even in a few days. Their summer is mild, but short, and variable; and the autumn, which in our English climate is so bright

and clear, and invigorating a season, is very gloomy and rainy at St. Petersburg; so rainy, indeed, that many of the streets become almost impassable.

The population of St. Petersburg is about 300,000. There are few or no manufactures carried on, but the majority of persons are occupied in business connected with the great trade of the country; from which other nations receive iron, hemp, flax, tallow, sail-cloth, cordage, hog's bristles, furs, tar, and other commodities. The poorer classes of the Russian peasants are warmly but coarsely clad in sheep-skin dresses: the dress of the poorer people of towns is rather more various; they wear a linen waistcoat, but no shirt; their feet and legs are wrapped in linen, and they wear boots, but no stockings: over all is worn a long coat, made full and thick about the chest and the waist; in winter they put on warm gloves, and a sheep-skin pelisse is worn instead of the coat. The women are less clothed, but do not stir out much; and neither the women nor the men pay sufficient attention to personal cleanliness; although the upper classes frequently use the bath. All classes, however, are fond of a hot vapour-bath, the stimulating effect of which upon the skin is such that they expose themselves freely to cold air, or even roll in the snow, after coming out of the bath, without inconvenience.

As regards the food of the Russians, that of the classes who can afford it does not differ greatly from that of the other northern coun-

tries of Europe. St. Petersburg is supplied with meat from various parts of the empire ; with veal from Archangel, eight hundred miles distant ; with mutton from Astrachan ; with beef from the province called the Ukraine ; and with pheasants from Hungary and Bohemia. The poor soil of the neighbourhood of the city makes it necessary for the citizens to receive provisions from a distance. In the winter season all the meat, poultry, and other eatables, are brought to market in a frozen state. There is a great market held for three days on the frozen Neva, in December, after the great fast, at which provisions are laid in by the whole city for three months. Many thousand raw carcasses of oxen, sheep, and pigs, with geese, poultry, &c., are exposed for sale ; and the larger animals are fixed upright in the snow. The poorer people live much upon a black and coarse bread made of rye or of barley ; and they are greatly addicted to the use of ardent spirits.

Neither in the town, nor in the habits of the people, do we find any cause in *itself* sufficient to account for the origin of the cholera. It appeared, as it has done in other places in its journey from the East, without any known cause. But, however introduced, whether upon the wings of the wind, or by the poor boatmen and traders on the Volga, it found a population prepared by many circumstances to receive it.

After remaining in the city about a month, the disorder began rapidly to decline ; and at length few new cases were observed. A recollection that this is about the period of its remaining in any one place may serve to prevent

hopeless dejection in the inhabitants of any town in which it appears: but it should on no account be forgotten, that in many cases the cholera has returned again and again to the hot and crowded cities of the East, and always with nearly the same malignity—a consideration which makes every precaution against it doubly necessary.

CHAPTER VIII.

PROGRESS OF CHOLERA IN POLAND AND PRUSSIA.

When the cholera appeared among the Russians, they were sending overpowering armies into Poland, and to the usual horrors of war was added the cholera, which is supposed thus to have been carried into Poland. It was in April of the year 1831 that, after one of the successes of the Poles over the Russians which afforded a hope that Poland might yet be free, the cholera appeared at Warsaw. In less than a month two thousand five hundred and eighty cases occurred either in the city or in the Polish camp. The Committee of Health established there describe the malady as beginning with giddiness, and with such violent cramps in the limbs, that the person affected falls down quite powerless; and is soon afterwards attacked with vomiting and dreadful pain.

Among the victims in the invading army was its general, Field-Marshal Diebitsch. On the morning of the 9th of June he felt rather poorly, but he seemed to get quite well in the course of the day. He went to bed at ten o'clock, and, although afterwards called up to attend to some business, still seemed quite well. About two in

the morning he felt suddenly ill, and called his attendants; but would not allow them to give any alarm, or even to send for a physician. But about three o'clock, feeling himself getting worse, he consented to have a doctor sent for, who found the General violently affected with cholera. He was bled, leeches were applied, and strong friction of the skin employed. The General desired all his attendants, except the medical men, to leave his apartment, lest they should take the disease. About seven, some perspiration was produced, and he was rather easier. He had until this time suffered but little cramp, but had had frequent fits of shivering and then of burning heat. Between seven and eight o'clock he began to have cramps in his legs, and in his stomach and bowels, with excessive pain, until near ten o'clock, when his groans became less frequent, and his strength was seen to be seriously reduced. He died at a quarter past eleven, about nine hours after his first indisposition.—The melancholy feeling with which one cannot but read the account of such a death happening to a brave man, in the very camp, is only lessened by remembering the cause for which he was in arms.

As soon as the news of the cholera being in Poland reached the Prussian government, great precaution was adopted to keep it away from Prussia. What is called a *sanitary cordon* was established from the Baltic sea to near Cracow, the line on which the Prussian frontier joins that of Poland. Along this line no travellers were permitted to enter Prussia, except at par-

ticular places, where they were subjected to certain regulations of quarantine; being obliged to produce a "bill of health," stating them to be free from all infectious disease, or else to remain ten or twelve days before proceeding on their journey. Such regulations are always very disagreeable to travellers, and are not observed with sufficient strictness, or for a sufficient length of time, to make them really useful. In the pursuit of gain, men become selfish enough to disregard the safety of a whole country, and even their own personal safety; and try every art to escape the quarantine laws themselves, and to convey the articles in which they deal from one country to another, without undergoing proper purification.

The cholera soon showed itself in Austria as well as in Poland; and then the Prussian line of quarantine was extended to that side also. But with all their care they could not keep out the cholera. Very soon after its appearance at Riga, it came to Dantzic; both of these are ports on the Baltic sea, and the latter is in Prussia. People and vessels coming from Dantzic were then as rigorously dealt with as if they had come from Russia; but still without effect. In the month of August, 1831, three months after the cholera was first seen at Dantzic, a case of it was reported to have occurred at Charlottenburg, near Berlin. The King of Prussia has a country residence or palace at Potsdam, where Frederic the Great used to live a great part of the year, and to which the King and Court occasionally resort.

So bad a fever prevailed at Potsdam during the late summer that it had been decided to make Charlottenburg the royal residence, and preparations were in consequence making at the time the first case of cholera appeared. The subject of this case was a boatman, who had come to Charlottenburg the day before in a barge ; and as there was no doubt of the nature of the disease, the King and Court set off immediately for Berlin. The cholera, however, travelled as fast as the King and Court ; for on the 29th of August, the very day on which the boatman was attacked and died at Charlottenburg, cases of cholera occurred at Berlin also, and also amongst the boatmen employed on the river Spree, which flows through the city, and the inhabitants of the houses on the banks of the same river. For many weeks before, the weather at Berlin had been rainy and hot : it suddenly changed very much for the better on the day when the cholera made its appearance, and the physicians thought that this produced a favourable effect.

Certainly the cholera did not attack so many persons as usual, although the number of deaths was equal to that of one-half of those attacked. On the 8th of September there had occurred 102 cases, and 58 deaths in nine days. Within the same period, the disease had attacked four times the number at Memel, a sea-port on the Baltic. One cause of the small number attacked at Berlin seems to have been the state of the city itself, which is greatly superior to that of many populous places. Few of the streets are narrow, and even the houses at the outskirts of the

town, where the poorer people reside, are not close and crowded. Everybody can *read* at Berlin; and pains were taken to instruct them how to avoid the cholera by temperance, and by taking care not to expose the body needlessly to cold. Suitable clothing and food were distributed also. Not a single case occurred in the garrison, where the soldiers had additional warm clothing allowed, and a better diet than usual. Whenever a case of cholera occurred in the town, the patient and his family were put under a kind of quarantine, which was continued for five days after either the recovery or death of those attacked. The friends were not allowed to leave the house unless they consented to go to houses prepared for their reception, and guarded with equal care. Cleanliness, and the use of the chlorine for disinfection, of which an account will presently be given, with directions for its use, were much encouraged by committees of health, who had persons in their service devoted to the care of the sick, and prevented from having intercourse with the healthy. Although these excellent regulations were sometimes defeated by the concealment of patients, and the wish to avoid trouble, they were yet so far of service that very few persons suffered from the disease except those who were intemperate in eating or drinking; or had been ill before, particularly of *diarhœa;* or exposed to cold and fatigue. It was several days before the cholera spread from the streets near the river to the other parts of the city, and it never prevailed very much in any part except where the people

were subjected to some of the causes of disease which are incidental to poverty. Dr. Becker, who stated all these circumstances in a Report to Mr. Chad, his Majesty's minister at Berlin, was one of the few persons in good circumstances who died of it: he had no doubt of the contagiousness of the disease, and seems to have been a victim to his humane attentions to the sick*.

The use of such remarks is, that cities and towns not yet attacked by cholera may learn from them how to lessen the number of its victims.

Enough has been said to show the ravages of the cholera; and it is only to be added that in July of the year 1831, when the disease was destroying so many people in Russia, it appeared in Arabia once more, after eight years' absence, and destroyed 20,000 out of 50,000 pilgrims who were on their way to Mecca. The heat of the weather was very great. Abdin Bey, a commander of the troops of the Viceroy of Egypt, had marched at the head of the pilgrims to Mount Arafat, and returned to his palace in the afternoon. He went to bed in perfect health; but at midnight both he and his wife were attacked with cholera, and soon after noon on the following day both were dead.

Even Egypt, which was kept free from the cholera in the years 1820, 1821, 1822, and 1823, has at length been attacked by that

* It was at first stated that Dr. Becker died of *cholera*; but such does not seem to have been the case.

malady. The disease appeared at Cairo in August, and all the attempts to keep it out of Alexandria were fruitless. Between the 21st of August and the 1st of September the deaths at Cairo were about *six hundred daily*. In fourteen days, out of its population of 300,000, the number of the dead was 7,735. The population of Alexandria is between fifty and sixty thousand; and there, in the same period, the deaths were more than one hundred daily. Five days after it appeared at Cairo it spread all over Lower Egypt, and to the ships of war off Alexandria. It is only in a report from Malta, dated October 19th, that we read of the cholera in Egypt being certainly decreasing.

There is every probability that this immense destruction of life at Grand Cairo arose from the peculiar state of that city. The banks of the Nile—(a river which will be found in the map flowing out of the northern part of Africa into the Mediterranean Sea; and which no Englishman can forget as the scene of one of Nelson's victories,)—are thickly inhabited; the villages are numerous; there are rich fields of corn and of rice; gardens and melon-plantations, and beautiful groves. But these appearances of comfort and enjoyment are counterbalanced by the general state of the country. "To strangers," says Dr. Edward Clarke, "particularly to inhabitants of northern countries, where wholesome air and cleanliness are among the necessaries of life, Egypt is the most detestable region upon earth. Upon the retiring of the Nile," (after its yearly rising and inun-

dation,) "the country is one vast swamp." At such a time, he says, the plague regularly begins, and does not cease until the waters return again. Then fevers and dysentery commonly appear. When the French army was in Egypt, the deaths by the plague were sometimes one hundred in a day. In the spring certain winds prevail which cover the sands of the desert with all kinds of vermin. All the plagues of Pharaoh come upon the people. And although there are fewer vermin, and fewer cases of plague and fever, when the waters rise again, different disorders then appear; a prickly heat of the skin, and often boils and ulcerations; and also a most severe form of inflammation of the eyes. Cairo itself is one of the dirtiest places in the world: every part of it is covered with dust, which is so small and fine as to penetrate into every room of every house. The streets are not paved: and a canal runs through the city, which is often filled with muddy water. The houses are infested with flies to such a degree that food cannot be taken without persons being employed to flap them away with feathers: and as liquor cannot be poured into a glass without being instantly covered with flies, the way is to keep the mouth of a bottle stopped until it reaches the mouth, and after drinking, to clap the palm of the hand upon it before passing it on to the next person at table. No care can keep the clothes or person free from the most disgusting kinds of vermin. The experience of the whole world

shows that where countries or cities are so neglected, diseases of an epidemic kind prevail with the greatest fatality.

The cholera is still prevailing at St. Petersburg, at Cronstadt, at Berlin, and at Hamburg; but the state of our own country now more nearly concerns us.

CHAPTER IX.

THE SPASMODIC CHOLERA IN ENGLAND.

WHILST we have been engaged in contemplating the progress of cholera, its destruction of human life, its advance from the burning regions in which it arose to the frosts and snows of Russia; and whilst these pages have been preparing for the working-man, in order that he may know the dangers which threaten him, and threaten all; the disease of which we have been speaking and writing has reached the shores of England, and is gradually, though with less violence, spreading from the place in which it first appeared to other towns; whilst the occurrence of cases of *diarrhœa*, and of *violent English cholera*, even in the centre of England, proves the strong *predisposition* existing to its attacks.

In such circumstances, inquiries which at any other time would only interest the medical public, become of vital concern to us all. We are told that our English cholera is merely a disorder dependent on an increased flow of bile; and that the true cholera of the East differs from the bilious cholera, inasmuch as instead of being attended with a great flow of bile, no bile is discharged, and the discharges are watery or resembling rice-water; it is said also that it differs

from it in the violence of the spasms, in the suddenness and fierceness of the attack, and in the extreme danger to life.

Every body knows that in the fruit season in England, it is very common to hear people complaining of disordered bowels, and simple diarrhœa or looseness. This is generally attributed to an incautious use of fruit; but it is so common, and so often observed in persons who never touch fruit, that the true explanation of it seems to be, a certain state of the air, which irritates the bowels, perhaps partly by increasing the flow of bile, and partly by increasing the flow of other secretions from various glands thickly scattered over the inner coat of the intestines. In some persons this diarrhœa is very slight, and does not require to be checked; in others it is more violent, and demands the aid of medicine, and in these cases it is very common for the person affected to complain of severe pain down the thighs and legs; in other cases, blood is discharged by stool, and this shows a more serious irritation of the bowels, often accompanied with inflammation, and is called dysentery; in others, again, there is nausea, cramps are felt in the legs, then a spasmodic pain in the bowels, and also in the stomach, a sort of *cramp*, in fact, affecting the muscles which have been described in the Introduction as forming one of the coats of the bowels. The consequence of this is, a forcible discharge of the contents of the stomach and bowels, by vomiting and by purging; and these contents are so often found to consist in a great measure of bile,

that this common form of the disorder in England is called the Bilious Cholera. Accurate observers may perceive a disorder in no respect differing from it, in the Spring, as well as in the Autumn, and chiefly, if not solely, when there is a great mildness approaching to warmth of the air, combined with considerable moisture. These are not perhaps the causes of the disease, but they very generally accompany the true causes, whatever those may be.

For the most part the Bilious Cholera is a manageable disorder. Measures calculated to remove the bile, if the vomiting and purging have not effectually done it, and subsequently to allay the spasm and irritation of the bowels, are commonly successful. Calomel is frequently given with the first intention, and opium with the second; and both are often given together. The warm bath, fomentation of the bowels with cloths wrung out of warm water,—with rest, quietness, the moderate use of stimulants, and careful diet,—are usually sufficient for the cure.

Yet even the English cholera is sometimes very severe. The skin will become pale or bluish; the countenance shrunk and changed; the voice weak; the pulse low; the whole surface of the body cold; the spasms violent; and the weakness excessive. In common English practice we believe this severe form is sometimes brought on by purging, foolishly resorted to *to carry the disease off*. It often carries off the patient. The vomiting and purging soon empty the bowels, and opium and warmth are the best means that can be used to produce

relief; or a little warm brandy and water, or some other stimulant is very often exceedingly useful. From the neglect of this, many patients die. The weakness is so suddenly brought on, and is so great, that the patient often faints as he walks across the room, or when he gets out of bed; and sometimes dies at once. The writer of these remarks knew a case in which a gentleman, supposed to have recovered, died at his dressing-table; and another, in which bleeding and purging had been very rashly employed, and the patient, a lady, died on stepping out of bed. When the vomiting and purging have ceased, if the bowels become confined, or seem full or uneasy, a moderate dose of castor oil, or of calomel, may be given with advantage; but early and continued purging by medicine, in addition to the purging by the disease, is mischievous and dangerous.

During the Summer and Autumn of 1831, whilst the cholera has been traversing the vast territory of Russia, the cases of English cholera were unusually numerous; and there has certainly at the same time prevailed a general irritability of the stomach and intestines, manifested by nausea, and by diarrhœa, of which the obstinate and long persisting cases have in some parts of England been very familiar to practitioners. Medical men would say, there has been a general disposition to irritation of the mucous membranes. The unprofessional reader must be reminded that the mouth, the stomach, and the intestines, and also the windpipe and all its branches in the lungs are lined with a smooth

membrane always covered or bedewed with mucus or spittle; and that first the influenza, and then all these cases of nausea, vomiting, diarrhœa, dysentery, and English cholera, have kept one or other of these membranes in a state of irritability ever since the month of May.

Even in the past month of December, on the very border of winter, the latter description of cases, usually limited to the months of July, August, and September, and to a short period of the season of spring, have been extremely prevalent. The weather was generally, it is to be observed, very warm and showery. More than two months have elapsed since the true cholera, —which we have no longer any right to call the cholera of the East, except with reference to its origin—the true spasmodic cholera, made its appearance at Sunderland, and there it still remains. To Sunderland it appeared to come at the end of October from Hamburgh, a port on the opposite coast of the German Ocean; at which port it had appeared, first in the shipping, and then in a drunken pauper who had been begging on board the ships, and then in the cellar where the pauper died; and then in other places. The first case at Hamburgh was noticed on the 5th of October.

Sunderland is a place of trade and shipping, from which the Newcastle coals are sent to the south of England in vessels. The inhabitants, most of whom depend for subsistence on the coal trade, dreaded that a knowledge of the cholera being among them would put a stop to this trade for a time, and cause them great loss.

Merchants and ship-owners, therefore, and several of the medical men, and others, declared their belief, at formal public meetings, and in letters printed in the newspapers, that the disease prevailing at Sunderland was nothing more than the common English cholera. It is to be hoped that all these persons had been imposed upon themselves before they began to impose upon others. In the mean time, this common English cholera, as it was called, was carrying off three or four patients every day in Sunderland alone, and the same kind of common English cholera was not to be found any where else. Dr. Daun, one of the London Medical Board, and who had been in India, was sent to Sunderland to find out the real state of the case. The disease in many instances seems to have been concealed from him; and the medical men's opinions were very various: but he soon declared that the Sunderland disease was the *true cholera of India.* During the month of November the London papers contained a daily report of the progress of the malady, under three heads—diarrhœa, common cholera, and malignant cholera. Up to the end of December a daily report has been made under the single head of cholera. The cases thus reported now amount to more than five hundred—all of which have happened in about two months; and of these five hundred patients, about two hundred, or more than one-third, have died.

Dr. Barry, whose name has been mentioned so many times already, fortunately returned from Russia in this very month of November; and

after being appointed with Dr. Russell and others to form a second or a central Board of Health in London, went to Sunderland; and set the question of the nature of the disease at rest by declaring that it was *the very same disease which he had seen at St. Petersburg.*

In Sunderland, as in almost every other place in which the cholera has appeared since it first appeared at Jessore, the first persons attacked were either sea-faring persons, or those engaged in traffic. More of the poor have died than of those better clothed and better fed; and more of the intemperate than the sober. The number of victims has been less in proportion to the number of cases than in the towns of the Continent, or of Persia and Arabia, or of India. These particulars, also, are interesting; because we gather from them the probable course and consequences of cholera in other parts and towns of England, all of which may possibly be visited in turn.

The cholera is now at Newcastle, at Shields, and in the neighbourhood of those places, proceeding very slowly, but still steadily proceeding.

We have spoken of a *wise fear*, which leads to the means of safety and protection. These means must be sought by a consideration of the history and progress of the danger that is expected. Such progress and such a history having been given in the preceding pages,—what is it that we learn from them?—and what means of safety and protection are to be adopted?—Let us reflect on what has taken place, that we may learn what we ought to do.

CHAPTER X.

HOW TO ESCAPE THE CHOLERA.

After the wide survey we have taken of the cholera, from its origin on the banks of the Ganges, under a tropical sun, in a country liable to the overflow of mighty rivers, and abounding with a luxuriant and ever-springing vegetation, and inhabited by a people whose habits of life, and religious and national prejudices, disposed them to receive it in its utmost severity;—to the appearance of the disease on the banks of the Tyne, in a temperate climate, where neither the heat of Summer nor the cold of Winter are ever excessive; where few and rare inundations take place, and the vegetation is not so abundant as at any time to spread the soil thickly with decaying materials; and where the people, living under a free government, educated in a religion which does not forbid the acquisition of knowledge, and all whose habits of life are more or less the dictates of reason and good sense;—after this extensive view of its progress, no words need be employed to show that it is a disease which may prevail under a vast variety of circumstances of climate and habits.

Mr. Kennedy, in his history of the contagious cholera, has very sensibly remarked, that our

experience of cholera has shown the error into which the first observers of the disease fell, of ascribing it to the most ordinary circumstances. If there happened to be a violent storm, or much heat, or an unusual degree of cold, when the cholera appeared, the storm or the heat or the cold were asserted to be the cause of the cholera; if a lake dried up, the cholera was supposed to arise from the mud and slime; if the east wind long prevailed, which is a wind that has a bad character in all climates, it was the east wind that brought the cholera. As it first was noticed in the thickly inhabited plains, it was supposed to be unable to ascend the hills. All these notions have been shown, by time and the progress of the malady, to be incorrect. It has crossed seas, mountains, and even deserts, but always, it would seem, with man—certainly always in the great thoroughfares of human traffic—a fact which may be and has been applied to prove its contagious property; although it is an imperfect proof, for the disease, even if carried along in the air only, could still only make its appearance where men were to be found. Among the mountains of the world, none are so lofty as those which may be seen in the map of India on the north and east of that country, called the Himalayah mountains; yet even there, the cholera has travelled up as far as man has carried his habitations. The town of Almorah, among those mountains, is 5337 feet above the level of the sea; but the cholera reached Almorah, and prevailed there as severely as in the plains of Hindostan.

Every day we hear the remark, that the winter will put a stop to the cholera—that the cold weather will soon make us hear no more of it. Those who make such remarks do not seem to remember that it prevailed all the last winter in Russia, a much colder country than ours. Still, it is to be acknowledged that as the cholera has advanced northwards, it has seemed to travel more slowly. Whether this depends upon mere climate, or upon the habits of the northern people less disposing them to receive the disease is not yet determined.

From all this, we only gather this piece of knowledge, that we have no reason in the world to expect that the cholera will *not* come among us, in whatever part of England, Ireland, or Scotland, we may happen to live or to be:—it is very well for us that it does travel more slowly here than in Bengal, for it gives us more time to prepare for it.

In making that preparation, nothing is so important as to keep in mind that wherever the disease has shown itself, it has been proved that some persons are more liable to its attacks, more *predisposed to it*, than others. It becomes a consideration which very much concerns us all—*what are the circumstances which do so predispose to it.* When once we know what they are, we may try to avoid them.

One predisposing circumstance has been observed in every climate—all irregularity of living, and especially all intemperance in drinking. It may easily be understood how the nervous system and also the heart and arteries become

weakened by any habit which has the effect of frequently exciting them. In the man who is drunk, particularly with wine or spirits, the action of the heart is much quickened, the pulse beats strongly, and the brain is so acted upon as to cause a false elevation of spirits : he is disposed to talk more and louder ; to walk, or dance, or sing more ; and to exert himself in everything, except what is industrious and useful, much more than when he is sober. All this is mere excitement. See the same man the next morning, and the excitement is gone. The action of his heart and pulse is languid ; and his vivacity is all departed. He has no wish to talk, and still less wish to dance or to sing ; and is, in short, as wretched as man can be. In the course of the day he recovers a little, and according to his age, constitution, and habits, requires a longer or shorter time for perfect recovery. Any person of common understanding must see that if this is often the case with him, the brain, so often stimulated, the heart, so often hurried and excited, must become disordered. It is from this repetition of excitement that we see in old drunkards the miserable depression of strength going on to palsy, or the violent action of the heart bringing on an apoplectic fit by causing a blood-vessel to burst within the brain. And if a man escapes these accidents, and goes on drinking and drinking, his liver becomes hard and diseased, or his stomach becomes inflamed, or his lungs become affected, or his general strength so lowered that he has no longer the power of resisting any cause of

illness;—and then, if he is exposed to the infection of fever, or of the cholera, he is sure to be attacked with it, and pretty sure to die.

There were in a particular part of India to which the cholera came, two companies of soldiers; one of three hundred, one of one hundred. The company of one hundred agreed to live temperately and to avoid the night air: and only one man caught the cholera. The company of three hundred made no such agreement, but went on as usual, and thirty of them died*.

Let him who reads this page, then, remember, when he lifts the glass to his mouth, that if it raises his spirits for an hour or two, it shortens his life by many hours:—that a man who borrows life and spirits and strength from strong drink, is like a man who borrows money, and must pay it back with interest by and bye:—and if he has unhappily fallen into a habit of drinking much, let him resolve to drink much less; nay, if he is in the habit of drinking ever so little beyond the point of needful refreshment, let him be sure that he had better drink *less* than that, than drink *more*. Fewer women have died of cholera than men, fewer children than women, and fewer sober men than drunkards. If a man's natural spirits and strength are habitually exhausted by artificial stimulants, his stock of spirits and strength will be so taken up beforehand, that if the cholera makes a sudden demand upon this stock, even his life must go towards the payment.

* Kennedy, p. 91, from the Indian Reports.

We may learn no less from observing how the cholera has treated people with relation to their habits of eating. On the one hand, a large majority of persons who have died of cholera have been very poor and wretched, and disposed to disease by the weakness which poor living has occasioned. This is no time to remind any of them, poor people, that their poverty has come of their idleness, or that their poor diet might be better if they were not extravagant and not ignorant. No doubt it is often so, and we must do all we can to mend such things. But England is a most kind and charitable country, and in every town throughout the whole island the rich, or those even a little raised above poverty, are giving their money and their time to help the poor. Some are supplying them with good and wholesome food; some are giving them blankets and flannel for waistcoats and petticoats; and some are busy making warm stockings for the little children. The Great Father of all human beings, who hates what is evil, and wishes the happiness of all his creatures—and who in permitting causes of evil and suffering, gives us faculties by which we can avoid and lessen them—will assist all these kind endeavours. and if the poor will *also* exert themselves, and not sit still and expect those who are better off to do everything;—if they will spend no money in what is not useful;—if they will be industrious and temperate;—even the cholera, which has swept away millions of people from the face of the globe, may pass over this island almost harmless, and all its

dreadful strength be scattered by the winds over the wide Atlantic sea and lost there, or driven to the icy regions of the North Pole where there are no men to be destroyed, and heard of no more. But all this, which, without the steady exertion of our common sense, would be little better than a foolish or romantic dream—must be accomplished by the employment of whatever knowledge we possess, and whatever care and caution we can employ.

There is no greater enemy of the cholera than cleanliness. If it were not for dirt and neglect, it is almost a question whether it would ever have found a substantial footing any where. It never goes first into cleanly houses; but creeps about the narrow streets, the confined and dirty allies, the damp cellars and the crowded garrets where poverty and wretchedness have taken up their abode before. There it finds a home, and becomes stronger and bolder; and after destroying its hundreds, it spreads forth into the air of a whole city, and triumphs over its thousands.

The care of the charitable persons who never forget the poor is extended not only to their diet, but to the cleanliness of their habitations. If the poor will only give them credit for good intentions, and not object to what they advise, they will be greatly the gainers.

But it is not the miserably poor who will read the Working-Man's Companion. It is addressed to those who do not depend on charity, but on their own honest industry. Among these, however, there are some who, although

temperate in drinking, are not always temperate in eating; and although not living in cellars or in garrets, are yet too careless about the dryness, the good air, and even the cleanliness of their houses. This is unworthy of them and of their wives at any time, but absolutely unsafe at the present time. A dirty house, or even a dirty room, sometimes becomes so unwholesome that *all* who live in it will die. When it is cleaned and whitewashed, and aired, all the danger is gone. In six days nine people died in one room in India, in barracks: the room was scoured and fumigated, and there were no more deaths in it.

Intemperance in eating may consist of excess, for of indulgence in hurtful food. If too much food is taken into the stomach, it is generally badly digested, and becomes a source of vexation there, and all along the windings of the intestines. It produces pain, distension, a sour or bad taste in the mouth, with some inclination to sickness; or disturbs the circulation in the head, causing a man to feel heavy and stupid, and at once to be sleepy and unable to sleep comfortably; or perhaps it disturbs the action of the heart and of the lungs, produces palpitation or violent beating of the heart, or difficult breathing. Now, if we just recollect what was said about the weakening effect of frequent disturbance of the brain and the heart, when speaking of drinking, we shall see plainly enough that the disturbance produced by over-eating leads to exactly the same ends, or at least to many of them; gradually weakening

the powers of digestion, and the action of the heart, and of the brain, and of the lungs, and lowering the strength of the body, and laying a man open to cholera or any other disorder that happens to be lurking in the air.

Coarse sour food; spoiled vegetables; damaged wheat; badly baked, or newly baked bread; stale beer, rancid butter, unripe fruit, bad cider, are all unwholesome, and produce all the uneasinesses and evils of indigestion. Food that is too rich or too nutritious will produce the same kind of mischief, and even more, whether it happens to be digested or not: if not digested, just the same, and if digested, the additional mischief of plethora or fulness of blood, a state always attended with danger.

A man who is in health, and can live by his labour, should be careful, then, to buy good and wholesome animal food and fresh vegetables; to have them well cooked, neither raw nor overdone; if he has any broth made, it should neither be watery and washy, nor greasy and fat. Mutton and beef are the best kinds of meat, because they are most easily digested. Bacon, pork, and all kinds of "pig-meat" should be taken seldom, and sparingly. A man's food is, generally speaking, best digested when it is most agreeable to him, if he does not take too much of it. Salt, pepper, mustard, vinegar, and other articles used to season food, are all good in moderation. Moderation, in fact, is a word which contains all the wisdom of all the books that were ever written, or that ever will be written, on the subject of *diet*. There is no

wisdom in always eating of one kind of food, and refusing all the variety offered by nature in the different seasons. There is no wisdom in eating raw meat and vegetables, and refusing to do that which man alone can do, namely to *cook* our food. It is moderation that is everything; and if a man's food is made agreeable to him, and he sits down to it with an appetite honestly got by exercise and labour, and at *regular hours* (which is a great thing also), he is not very likely to eat more than will do him good.

It is not a common fault for a working man to live *too low*. But there are some who do, and they are the *drinkers*. A man who is tired and exhausted, and cold, drinks a glass of raw spirits, and because it produces some warmth, and rouses his languid heart and nerves—as the whip and spur stimulate the jaded horse—he fancies that it does him more good than food:—which is just as foolish as it would be to suppose that the whip and spur would keep the horse in as good condition as hay and corn. To live poorly is a bad thing, and to drink is a bad thing; but to live poorly and to drink too, is certain destruction.

But what is the working man to drink?—It is here, as it was with respect to eating, that general rules are foolish rules. Good beer, or ale, not so strong and heavy as to stupify, is perhaps the best ordinary drink; even better than water: but if a man drinks water, and feels well and strong, there is no necessity in the world for him to take to drinking beer. And with respect

to beer, as with respect to mutton and beef—let the wisdom of *moderation* not be forgotten.

The wives of working men are too fond of tea; they take it three or four times a day, and drink it to excess, not unfrequently with a *little* gin in it. This is a very hurtful custom. It makes them careless about good food. They get weak, and *nervous*, and troubled with stomach complaints. They have no appetite. They cannot nourish their infants properly, and so the *baby* has a little gin given to it also. They get into idle habits; spend several hours a day in a kind of half muddled state, gossiping with the old women of their neighbourhood; and neglect the husband's dinner, and do not keep his house clean, or wash the children's clothes or mend them. Thus one evil leads to many evils. No working man should let a drop of spirits come into his house except as a medicine.

So much for eating and drinking.—Whoever has looked over the history of cholera in the foregoing pages must know that there are other things which invite the cholera. One of the most common causes of disease is moisture or dampness, whether combined with great heat or great coldness of the air. In a former number of the Working Man's Companion * it was mentioned, in the account of Dew, that travellers in the coldest parts of North America had described themselves as remaining in good health during the severest frosts, but as becoming ill and rheumatic or feverish when the thaw came;

* Cottage Evenings.

and that the people called the Esquimaux, who build houses of ice and frozen snow, enjoy good health in them in the winter, but all become affected with bad colds when the warmth of the sun becomes sufficient to melt their houses in the spring.

It is the same with respect to heat. There is not in all the world a finer climate than that of Egypt, which is remarkable for its dryness, except *after* the annual overflow of the Nile, when the ground is only drying; and as it soon gets completely dry, the unhealthy season is of short duration*. The excessive heat of India, if accompanied with a dry state of the air, agrees well with most people; their appetite and spirits are good; they are hot enough, to be sure, but not at all ill. It is when the rains come that they feel depressed, and that fevers and all sorts of evils come too. And if we look at home, into our fenny countries, we still find that the spring and the autumn, when the moisture is most abundant, are the seasons of ague and other fevers.

Medical men, who are in the habit of looking at places and at people with reference to the subjects of health and disease, have long known that a continued residence in a damp and marshy situation, although it may not actually produce a common fever or an ague, yet gradually undermines the health; makes the stomach weak, the functions of the skin languid, and lowers

* Different statements have been made by travellers; but those who have seen most of Egypt give this account of its climate.

the general strength. Persons brought into this state have a sallow dejected look, and are very open to the attacks of disease. The intention of all these remarks on the effect of dampness and moisture is to impress on the working-man the necessity of guarding, at all times, but at this time above all times, against living in a damp house, or sitting longer in damp or wet clothes than he can possibly help. It would have been easy to say, "Avoid wet clothes and damp houses," but we wished the working-man to see the *reason* for it; and that reason is drawn from the experience of men, not only in the few countries mentioned, but in all kinds of climates; in Europe, Asia, Africa, and America.

The dampness of houses commonly arises from the ground not being properly drained. The tenant should represent this to the landlord, whose interest it would generally be to remedy the evil, particularly if the tenants always gave a preference to houses that were drained properly. It has been too much the custom to neglect this, even in the best cottages which have been built within the last ten years; and the writer has known fever linger about in such cottages, and go from one to another down long rows of them, for more than a year, when not a single case of fever was to be met with in any of the old-fashioned cottages in the neighbourhood. To keep the house dry, it is necessary that it should not be washed too often in cold weather, unless there is a good fire in the house. If the bed-rooms are well swept every morning, and the floors brushed with a hard

broom, they will not require to be wetted very often in winter; and in the warm days of summer, if the windows are set open, the wetness will soon dry up. From mere idleness, dirty water, which has been used in cooking or otherwise, is too often carelessly thrown out close to the house-door, and a sort of puddle, very offensive to the sight and smell, is thus created, which makes the whole house disagreeable.

Another great fault in many of the new cottages is that of having only one door; or not even a window at the back of the house: it is difficult to keep such houses dry and properly ventilated. Some cottages are built back to back, and are always very unhealthy. In large towns it may not always be easy to command sufficient space for every convenience; but even in country villages, and still more in country towns, the number of narrow, damp, neglected alleys is surprising. A narrow entrance leads to a row of twenty cottages: all the ground about them is wet and disagreeable; the inside of the walls is stained with damp; perhaps there is a small ill-managed garden, which sends up every smell but a good smell; or, more frequently, there is a half-paved, half-mud court, with pig-sties, privies, and manure heaps almost as high as the cottages, and sending bad odours into every door and window; so that the people in the houses, shivering from the cold walls, and half poisoned with the bad smells, take all possible pains to shut out every breath of air, seldom open door

or window, and stop up all holes and crevices with dirty old clothes.

It is in such places that the cholera has invariably been the most destructive; and if it comes from the eastern coast across England, it is in such places that we shall behold its worst ravages: it is for the interest, therefore, of all classes, that the evils here pointed out should be attended to, and carefully and thoroughly remedied.

Perfect cleanliness of the person may be preserved without wearing damp clothes. Clean linen should always be put on quite dry. If a workman is exposed to rain, and gets wet through, let him *keep moving* until he has an opportunity of taking off his wet clothes. If he has no dry clothes to put on, it is better to go to bed than to sit in those that are wet. If he is both wet and cold, he should take off his damp clothes, rub his skin briskly with a coarse towel, sit by the fire or go to bed and wrap himself in the blankets, first putting his feet into warm water, and drinking some warm tea, gruel, a comfortable posset, or a glass of good brandy. It is at such times that the *use* of spirits may be permitted, although not their abuse.

In the short view of the structure and functions of the human body given in the Introduction, it was stated that the true *skin* was full of blood-vessels and nerves, and performed several important offices: and also that there was a great sympathy between the skin

and some of the internal organs, as the lungs and the intestines, so that one was seldom affected without the other. Few diseases afford us a stronger instance of this affection of the intestines and of the skin at the same time than the disease which has been the subject of so considerable a portion of the present volume. Together with the state of irritation and spasm of the intestines, we have seen that the surface of the body was pale or blue, and covered with cold perspiration, and that the skin had the coldness of death. Every one may have experienced that the exposure of the body for a long time to the heat of the sun produces some disturbance of the stomach; nausea perhaps, and aversion to food. Exposure to cold air, or even plunging in cold water, when the coldness is not long applied to the body, revives and invigorates all but those who are very feeble. It depresses the feeble; lowers the circulation, cools the skin too much, and produces shivering: the blood seems to desert the surface and to crowd the vessels of some internal organ, and the person complains of headach, languor, and general oppression. The same effect is produced by a very long exposure to cold in even the strongest persons; for although a short exposure is followed by a glow, or greater action of the vessels of the skin, a continuance of the cold depresses the circulation so much that no glow follows—no reaction; particularly if the individual is not taking active exercise at the time of being exposed to the cold. After such long exposure follow various irregularities of the cir-

culation: sometimes inflammation of the lungs or of some other organ; and sometimes a fever; sometimes simple colic, sometimes diarrhœa, and sometimes dysentery.

These are the reasons we have for saying, Do not sit still in damp clothes, and do not live in damp places. The long continuance of dampness applied to the body not only lowers the strength, and disposes the body to several diseases; but in a particular manner disposes to disordered actions and cramp of the stomach and bowels; and *cholera* being a disease in which there is very violent disordered action and cramp of the stomach and bowels, it is not necessary to say a word more to prove that the caution against damp rooms and damp clothes of any kind is one that nobody ought at this particular time to neglect.

It is one thing to give advice, and another thing to be able to act upon it. A working-man may be perfectly convinced of the disadvantage of being exposed to damp and cold air, or of wearing clothes that are not dry, or of living in moist situations; but his occupations and many other circumstances may tie him to a particular spot, and make it necessary for him to run some of the risks of which he knows the danger. In that case all he can do is, by keeping himself in good health, by careful diet and regular habits, to lessen the likelihood of his being made ill; and also to wear warm and sufficient clothing, particularly woollen clothing, which does not allow the warmth of the body to escape so rapidly as linen. All those

who are of necessity exposed much to cold and moisture, all who live in cold damp houses or situations, and all who have irritable bowels, soon disturbed by changes of weather, should wear flannel next the skin. A long flannel waistcoat with sleeves, and even flannel drawers, will be found the best means of preserving their health, and of guarding them against spasmodic attacks in the stomach and bowels, and even against the cholera. If the expense of a flannel waistcoat is any obstacle, (it cannot cost more than a few shillings ; from two shillings to four at the utmost,) or if a waistcoat of flannel should be found uncomfortable, a flannel band should be worn round the bowels, at least eight inches broad; and the women should wear wide, full, warm, and old-fashioned flannel petticoats. They say that the Dutch, whose broad figures amuse us so much in pictures, are seldom or never troubled with coughs and colds*. Their houses are cold, and their love of cleanliness is so great that they are perpetually washing and scouring their rooms : the climate of Holland, too, is damp and chill : but the Dutch women wear thick warm stockings, and at least half a dozen good substantial petticoats : whilst the men wear clothing equally thick, including almost as many waistcoats as we have seen the grave-digger take off one after the other in the play of Hamlet. Although it might be some time before we English people should like to see our wives and daughters as shapeless as the Dutch, both we and they might still borrow part of the dress of

* Beddoes.

that industrious people with benefit. There can be no doubt that many young women die of consumption in England from their unconquerable unwillingness to wear sufficient clothing; and the general custom of women as regards the clothing of their feet is quite unsuited to our moist and variable climate, in which the feet can not always be kept quite dry even in a summer's evening walk in the meadows. Those who know how often damp feet bring on disorder of the bowels, will know, therefore, that keeping the feet dry and warm is another good and sensible precaution against the cholera.

As the winter is coming on, care ought to be taken to have all the bed-room windows mended. The effects of cold upon the body are much more dangerous during sleep than when we are awake. More clothing is required by night than by day. Dry rooms, clean sheets, and good warm blankets, will do more than any medicine to keep off attacks of cholera.

Warm clothing, then, and personal cleanliness; good food and suitable drink; clean and white-washed houses, kept dry and of a moderate warmth; neat and dry court-yards, free from all the offensive nuisances which have been mentioned; gardens well cultivated, and not smelling of decayed vegetables; these are the chief things to be attended to by way of keeping off the cholera altogether. By avoiding dirt, cold, bad air, bad food, intemperance, you avoid so many things which weaken the body and dispose it to disease:—and it may be added, although you cannot help sometimes working to

fatigue, you will do wisely to avoid *unnecessary* fatigue.

But supposing that the cholera is actually in the town in which you live, or even in the very street in which your house is, what then are you to do:—the cholera is far enough from you at present, perhaps; but why should it not reach your town as well as Sunderland, or as well as Newcastle or as Shields?—and if it should, how are you to act? This question, like all the rest that concern you, must be answered by a consideration of some of the laws and other circumstances of the disease.

The first consideration that would press itself on your thoughts at such a time would be, whether with all your care you and your family might not yet take the disease from some of your sick neighbours. You have been told how medical men differ on this subject. It has been mentioned to you that in a great number of instances the disease has *seemed* to be carried from one place to another by individuals or by their clothes or goods; and that yet so many persons escape who have had more or less communication with the sick that many doubt the possible communication of the malady from one person to another. Examples have been given of places and persons apparently secured from the disease by being carefully separated from others; and of other places from which no care or caution has appeared able to keep out the cholera. In the history given of cholera you must have remarked it has *first* appeared in sea-ports, seeming to be brought from

other sea-ports: how much reason there is for thinking that it went by sea from Baku to Astrachan; and came by sea from Hamburgh to Sunderland.

In the midst of so much seeming contradiction, you have been reminded that some of the difficulties of the subject may be got over, and some of the contradictions reconciled, by considering the cholera as a disease resembling in its origin some of our fevers which are attended with eruptions—for instance, the small-pox, which, let it be remembered, is a disease new to the world since the time of the ancients, no less than the cholera; a disease too which came to us as the cholera has come, from the hot regions of the East. Regarding cholera as a disease originating in a certain state of the air, and when acquired by one individual capable of being communicated to a second; but still continuing to arise in other persons from the original source, and only communicable to persons predisposed by particular causes to receive it; it has appeared as if some clue might be gained to a labyrinth of facts and arguments, and some clearness might begin to prevail where there seemed to be so much confusion before.

Leaving, however, the settlement of this question to medical men, many of whom are willing to devote their time, and some of whom are ready to peril their lives in the investigation; it is, in the mean time, the part of every person of sound mind *to act as if the contagion of cholera was positively proved.*

We must once more remind the reader that it is only a *wise* fear which we wish to excite in his mind, and not that extravagant terror which prevailed in the Indian army, where, the common people being unprepared by what has been recommended in this chapter in order to *avoid* the disease, fled in distraction, and left the sick to die, and the dead to be devoured by the fowls of the air.

Although the small-pox has been mentioned by way of making our view of the causes of cholera intelligible, it should be stated that the contagion of cholera appears to be far less powerful than that of small-pox, and more like that of our common typhus fever. If a person who has not had the small-pox, and who has unfortunately not been vaccinated, comes into the same house with one who is lying ill of small-pox, he is almost sure to take the disease: but there is no such fear in a typhus fever; which is only communicated to those who are a long time with the sick, and sit close to them, or inhale their breath; and not always even then. Yet we have known whole families ill of typhus fever, and left to die, because no nurse would go near them. Such fear is quite unnecessary. There seems to be a poisonous air about a fever patient, and also about a patient ill of spasmodic cholera. This air is the *most* poisoned the *nearer* it is *to the sick person.* Within a few inches it is very powerful;—a few inches farther off it is more mixed with common air, and therefore weaker; and at the distance of a

few feet it is so much mixed with the common air as not to have the power of creating disease in those who breathe it.

From these facts we learn, that nurses and neighbours need not withhold their assistance from the sick,—and also that in attending upon the sick they ought to observe certain cautions.

Those who attend the sick are above all things interested in having the sick-room kept clean. Idle nurses, who allow the sick person to remain with linen unchanged for several days, or with dirty sheets; or who take no pains to expose the blankets to the fresh air; or who allow offensive matters to remain about the bed; or who neglect to open the doors and windows; are fond of securing themselves, as they foolishly imagine, from all danger, by smelling salts or vinegar, or by camphor, or by keeping lozenges of some kind or other in the mouth; all of which things are useless, whilst at the same time they render the air about a patient very disagreeable, and still conceal such bad smells as ought to be attended to and removed.

Nothing is more abominable than to see a nurse, careless of the continual attentions required by a person suffering all the torment of a fever, thinking only of her own eating and drinking, and doing both to excess;—sometimes, indeed, excited by spirits or wine, of which there is always too unrestrained a use in a sick house, and then disturbing and fidgetting the

patient about a hundred things which ought to have been done at another time*.

The first thing, then, for those to do who are much about the sick, is to see that the room is clean—that there is no collection of clothes or rubbish under the bed—that the bed-linen and the patient's dress are not neglected—*and that there is no bad smell in the room.* In the case of cholera, whatever is discharged from the stomach or bowels should be immediately taken away.

The nurses and attendants are obliged to be a great part of their time with the sick:—this is attended with less danger to them than might be supposed, provided they keep the room and patient clean; live pretty well, without intemperance; are cheerful and active; and, except when actually attending to the sick person, place themselves near the window or door, so as not to be exposed to a continued stream of air *from* the patient. It is also quite certain that the nurses and attendants become accustomed to the atmosphere of a sick room, and are not so liable as others to become affected with infectious disorders.

* There is no occasion on which drinking freely seems less in character with the circumstances of the time than at a *funeral;* yet on no occasion is it more common. It often arises from a fear of infection: a foolish notion being entertained that it *keeps out* infection, the attendants at a funeral often partake of wine, or even of spirits, until their red faces and stupified expression cannot be observed without disgust. Others are persuaded to drink because "sorrow is dry;" which is still more shocking. Altogether it is a most offensive and disgraceful custom.

Those who are not in actual attendance on the sick, but who go to see them as friends and neighbours, should not make *long* visits to them; nor sit too near them; nor inhale their breath;—if there is any kind of bad smell in the room, they should not go in until it has disappeared;—they may shake hands with the patients, but should not kiss their lips. If a window is open, they should sit between it and the patient's bed; if not, between the door and the bed, that the air may be carried from them towards the patient, rather than *from* the patient towards *them*.

No clothes that have been used by the patient should be put into drawers with the clothes of other persons: all the dirty linen, sheets, &c., when taken out of the room, should be put at once into water out of the house, and then hung up in a free current of air.

The best thing that can be done by way of *fumigation* is to use the *chloride of lime*, and its use is very simple and easy. It may be procured at any druggist's shop, and is not very dear; a pound of it, which may be had for sixpence, is sufficient for a gallon of water, in which it should be dissolved. Some of this water should be sprinkled over the bed-room twice a day or oftener; not in great quantity at a time, because it is too stimulating to the lungs of a sick person. The stairs and passages may be sprinkled also.

Some of this solution, or water containing the chloride of lime, should be poured upon the matters discharged by the vomiting or purging

of the patient. Dirty linen might also have some of the solution poured over it.

The vessel, or jar, or jug, in which the chloride of lime in water is kept should have a cover.

In case of death, all the bed-clothes and linen worn by the patient should be purified in the same way, then put in water, and dried in the open air: the bedstead and bed-room, and all the articles of furniture should be scoured, and the room throroughly ventilated, and if possible white-washed before being slept in again. The drying of the room will be best promoted by keeping a fire in it, and having the windows and door open.

It must, however, never be forgotten that *neither the chloride of lime, nor any kind of fumigation whatever*, will destroy infection, or make it safe to go near persons sick of cholera, or of any description of fever, without *fresh air*, and *constant cleanliness*. But if *all* these things are observed, the fear of the cholera or fevers spreading would become very small indeed.

Besides these precautions, which the safety of individuals makes it most desirable that they should adopt willingly and without opposition; the public safety might possibly require some additional ones; such as the prevention of any communication between persons in infected houses and other persons, &c.

On these we shall not make many observations. If the cholera should become more general in England, the public authorities of different towns, assisted by the physicians, will do

all that is required; and if too much is said about such measures before they become necessary, it leads to needless alarm, and may even cause the concealment of the disease until too late for the safety of the patients or their neighbours.

These precautions, which *may* become necessary, should not be placed in such a light as to create a panic for which there are no reasonable grounds. They are only mentioned *now* to show, that in case of the worst that can happen people will not be left to perish for want of care.

In closely built towns, where cholera may be expected to be very fatal, it will possibly be proposed that the sick should always be removed to hospitals prepared for cholera patients. This measure is often a very welcome one; for the person removed gets better attended to than he could be at home. But if the friends object to its being done, it ought not to be done; for by proper care at home those in the house may either be preserved from the disease, or their neighbours protected against it. The friends *must* in this case submit to be kept within certain limits, and to be debarred from going into other persons' houses until all fear of infection has passed away, which it cannot be in a shorter period than a few weeks.

The houses in which persons were ill of cholera would, perhaps, in such circumstances, be supplied with all things necessary by persons appointed to leave them at their doors: and they would be carefully attended by medical men especially appointed to that duty.

Stations would be fixed where persons in whose families the cholera appeared might apply for medical aid, provisions, medicines, wine or cordials, and the chloride of lime for fumigations. Proper attendants and nurses would be provided; and active assistants, who would instantly supply blankets or whatever else might be required.

The same persons would probably, also, take measures for the burial of the dead, and for the perfect purification of houses; as well as for the protection of all kinds of property.

Very particular care would be necessary with respect to lodging-houses for the reception of vagrants, beggars, and the poorest and most unfortunate class of travellers. Every person arriving at such house ought to be seen at once by a medical man, and if out of health removed to an hospital, or kept separate from other persons. Such houses, and indeed every house, ought to be visited *frequently* by persons who should be authorised to enforce the observance of cleanliness. All classes should be made to understand that the choice was *cleanliness, or death.*

A few other regulations might be found necesary, but those which have been mentioned would answer every important end, even if the cholera was raging amongst us as it is to be trusted it never will rage.

Let no one give way to foolish fears; but rather feel quite sure that ordinary care will make the disease almost harmless; and that, if it should become more severe and general,

every thing will be done that man's prudence and forethought can devise to preserve the lives of those attacked, and of all about them. Fear alone will sometimes produce irregular actions in the stomach and bowels; and it always lessens man's power of resisting disease as well as danger.

After all, it would be unworthy of an enlightened and brave people to take fright at the cholera, and most disgraceful to run away by hundreds, or to turn robbers and desperadoes in the presence of such an enemy. Many men go into battle again and again, well knowing the danger. Many incur danger by sea and land for pleasure's sake. Surely then, if the cholera does come, it ought to find us not only well prepared to keep it out, but, having done all we can, if we must fall, prepared to fall as becomes men and Christians.

The danger of cholera, even in its worst humour, will not be long continued. We should, however, know exactly what we are to expect. For a week or two, when it comes near us, there will only be cases here and there, and many will ridicule the fears of the timid. Then great numbers will be attacked and die, some in the midst of apparent health and strength; and then many, including those who laughed at fear, will fly like people bereft of their senses, carrying the cholera with them perhaps into a hundred villages. Those who *remain*, and *take every precaution which has been recommended*, will very likely escape, and in another week or two there will be no new cases, and no more dan-

ger, *except from the return of the runaways*, who will come from places to which some of them took the cholera, and where it has not yet run its course.

This view of the danger will convince every thinking man of the duty of consenting at once to do all that may be required of him *without running away*, or, if he has run away, *before he is allowed to come back.*

Those who run away should go to single houses, or to tents pitched in the fields; and if those who stay will avoid intercourse with the sick, and submit to, and encourage all the useful measures which the public safety demands, the number of deaths will soon become very small indeed.

CHAPTER XI.

TREATMENT OF CHOLERA.

The character of cholera being so fatal, we are naturally led to ask how it may be escaped, or how, if a person is attacked with it, he ought to be treated. This is the true end of all our inquiries. It is for this that we study anatomy, and inquire into the manner in which the different functions are performed. It is for this that we make such very diligent observations on diseases in all climates, and compare their symptoms, and look at the effects after death. By these means the physician or the surgeon learns to cure diseases, or to guard the public from them: and by the same means those who are neither physicians or surgeons may learn to take some care of themselves.

The attacks of cholera are made so suddenly, they excite so much alarm, and so soon destroy the patient, that there is no disease of which it is more desirable that *all* persons should know the proper management. Even in towns, if the disease should unfortunately become very common, persons might be lost for want of proper medical attendance: and in lone houses and cottages in the country, a severe attack of cholera would often carry off the patient before a medical man could reach him.

As happens with respect to all diseases of which much dread is entertained, a thousand remedies have been cried up for the cholera. At least twenty books have been published within the last three months, most of which contained some new plan of treatment. The newspapers have had advertisements of many infallible remedies. Every man who has ever breathed the air of the tropics has conceived he had a right to be an oracle on this occasion,—often on little better grounds than the man who thought he *ought* to know something of navigation because he had a cousin who was mate of a ship.

During a great part of the time that cholera has prevailed at Sunderland, the daily reports of the physician, Dr. Daun, noticed cases of three kinds, 1. Dysentery; 2. Mild cholera; 3. Malignant cholera. All of these have occasionally been fatal. At Moscow, Dr. Keir says the cholera began in some instances with ordinary diarrhœa; and that if this was neglected, it went on to cholera. Several persons employed in the hospitals had nausea, vomiting, and bilious diarrhœa. At St. Petersburg, many confessed that they had concealed a diarrhœa for a day or two. It is therefore plain that all these forms of disease were but degrees of one disease,—degrees of irritation of the stomach and bowels, attended in many cases with so much irritation of muscular parts as to bring on the vomiting, or the purging, or both, together with the violent convulsions.

In some cases at Moscow, an eruption, like the nettle-rash or the measles, appeared on the

skin; and the patients in whom this appeared commonly recovered. In cases of measles and small-pox in this country, where the eruption does not readily come out, convulsions sometimes occur, which are ended by the breaking out of the eruption. These facts, put together, point to a mode of relieving the internal organs, by acting on the skin; and this is *one* of the points to be kept in view in the cholera. It would seem that much of the blood, or perhaps of the nervous energy also, which ought to be employed in the small vessels of the body, including those of the skin, is mis-directed to the muscles which form, as has been explained, one of the coats of the intestines, or to the nerves which govern their motions, and there produces irregular action and mischief. If we can draw it back again, to the small vessels of the skin, and of other parts, we shall relieve the muscles and their nerves, and the convulsions will probably cease.

But this is not *all* that we are required to do. —If we would understand how to manage a patient ill of cholera, we must consider how he is affected by it altogether. Let us remember that this is his state—that his skin is very cold —that the action of his heart is very weak— that for a time he has violent vomiting and purging—and then extreme depression—that sometimes the depression comes on before the vomiting and purging seem to have time to begin,—and that the depression may be so extreme and so rapidly brought on that the patient may die as if he were poisoned. Let us re-

member, too, that there is often no *visible* disease of the stomach or bowels after death, and that when there is any, it is of an inflammatory character—that the heart and the large blood-vessels, and the vessels of the lungs, and the liver, and the brain, are full of black blood, and that the vessels of the skin are apparently empty.

All this being in the mind, or the leading parts of it—when a friend or neighbour is undoubtedly attacked with this fierce disease—what is to be done?

Rules of treatment laid down in a book are always *general*. Good sense must still govern their application. But, *generally* speaking, the best thing that can be done in the first hurry is to get some warm and comfortable drink prepared—hot brandy and water is the best of all—to place a good blanket close to the fire, until it is quite warm—to undress the patient from head to foot, before a fire too—to let him drink his brandy and water, whilst his feet, legs, hands, and arms are briskly rubbed,—and then to roll him completely up to the chin in the hot blanket. Even his head should be warmly covered up; only leaving him room to breathe.

In all this there is nothing required (except the brandy) which is not to be found or which may not be managed in any house or cottage. Hot tea, or even hot water, if there is no brandy to be got, will be better than nothing; if the patient can keep it down. But when the cholera is expected, everybody ought to buy or beg a little brandy, and keep it as a valuable medicine.

Laudanum, again, is a dangerous thing to have in the house at all times, for children or ignorant persons may drink it by mistake. But those who live far from medical advice should have a little bottle of laudanum by them. Laudanum is opium dissolved in proof spirit. Opium is the dried and thickened juice which flows when incisions are made in the head of the white poppy, cultivated for the sake of opium in some of the countries of which we have been speaking, as India and Persia. We get opium from India and from Turkey; that which comes from the latter country is the strongest: the Turks are in the habit of taking it in large quantities to produce a kind of intoxication. Taken in a small quantity (a quarter of a grain) it produces excitement; in a larger dose (one or two grains) it allays pain, and produces sleep; and, in a still larger, it puts an end to life. In many spasmodic diseases it is given freely, without producing the bad effects which it would if given in the same quantity to a person in health. The solution of opium in spirit, or *laudanum*, is the best form of the medicine for a cholera patient, as it is in that form most likely to act on the stomach without delay. The usual dose of laudanum is from ten drops to forty. In a case of cholera thirty or forty drops should be given at first in the brandy and water. If the edge of the laudanum bottle is made wet on one side, it will be easy to drop it out, drop by drop, into an empty glass; if it runs out too fast, the dropping must be done over again, until done properly.

Common sense will inform every reader that this dose, which is meant for a grown person in a severe attack of the disease, would be more than necessary for a young person, or for a weak person, in a *less* severe attack of the disease. Without the exercise of the judgment, medicines become more destructive than diseases.

So also the repetition of the medicine—laudanum and brandy, or any other medicine, or the changing of the medicine for anything else—these are points which few could be competent to without medical knowledge. While what has been already recommended has been done, if not before, it is to be hoped that some medical man will see the patient. When the blankets are warming, and the brandy and water preparing, a messenger should be sent off in all possible haste to the medical man. Everything depends upon that. Many of those who died at St. Petersburg died in consequence of not having medical assistance soon enough.

But there are persons so situated as to have no means of getting advice for some hours; far off in the country, through bad roads, and in the night, and their medical man attending some other patient whom he cannot leave. Some rules must be laid down for them. At all events let the brandy and water be given, and the patient wrapped in his blanket, and if there is any laudanum give it him. Then there will be time to collect one's thoughts a little.

Consider, then, what are the effects to be expected from what you have done. The skin was cold, the blood had deserted it for the internal

organs; you have applied external heat for the purpose of bringing back blood and warmth. There was vomiting, or purging, or both, and sudden weakness; you have given hot brandy and water to overcome the spasm of the stomach and bowels, and laudanum to assist in so doing, and to lessen the disposition to spasm or cramp in the fingers and toes. The best rule for going on with these means would seem to be found in the continuance of the symptoms; the best guide to the giving no more would seem to be the relief gained from what was already given.

It is unlucky that what seems very simple in medicine is often very deceitful. The actions of the body we have seen are very much tied and and bound and chained together; and in the disorder of many functions, a simple treatment is not always the best.

If a medical practitioner sees the patient immediately after he is attacked, he will *not* invariably do what you have now been told to do. But whatever else *he* does will be what you could not very well do, or what, if you could, could not be left to your judgment. It depends on that of which you could not be a judge. We will try to give you some explanation, however, of what he would consider, and what he would do.

In the first place, he, with the same general intention of restoring the circulation of blood in the skin, and bringing back its warmth, or even of exciting it to warm perspiration, which many look upon as a certain cure, might advise strong friction of the body with the hand,

or with hot coarse towels, or with equal parts of mustard and flour, or with embrocations containing camphor (camphor liniment): he might advise bottles of hot water, wrapped in flannel, to be applied to the soles of the feet, to the pit of the stomach, under the arms, and under the joints of the knees; or he would, perhaps, order a hot bath to be prepared immediately (although when the patient is *much reduced* this is not safe), and the patient to be placed in it, and kept there a quarter of an hour, then well rubbed and dried, and placed in the hot blankets. Some medical men prefer communicating heat in the form of vapour,—either vapour from hot water introduced under the blankets, or by burning spirits under the bed-clothes. Some apply heat by means of bags of hot sand, hot bran, hot oatmeal, or hot air. The means are very various; but the intention is the same. Whatever can be soonest employed is best.

A much more important question is to be determined by the medical man. After the practitioners in India had lost many patients, they began to *bleed* those who were attacked; and the success of this practice was considerable. Bleeding then became the common practice in every case; and it happened that in many cases it did no kind of good; and that in others it seemed to do positive harm. The advantage looked for from bleeding is the relief of the organs oppressed with black blood, in the hope that the heart will then be able to resume its action, and send blood once more into the small

vessels of the skin. The disadvantage of bleeding, on the other hand, arises from its possibly hastening that state of extreme depression of strength which so often goes on to death. This may serve to the unprofessional reader as an example of the difficulties of medicine, and of the necessity there is that those who practise it should possess a good understanding, strengthened and carefully exercised by a good education. In a strong person, or in one who is plethoric (or full of blood), and in the very beginning of the attack, it is exceedingly probable that bleeding would be of most essential service. In a feeble person, or when the disorder has been present some hours, it will seldom be admissible, or even safe; and often very dangerous. The medical man can only be guided by the circumstances present in each particular case.

The extreme debility which so soon ensues upon the symptoms of cholera must never be forgotten · slight circumstances may entirely destroy the patient's life: every violent impression must be guarded against. The chance of good effects following bloodletting is greatest the earlier it is performed. And the same may be said of large doses of opium, or large doses of calomel, or of any kind of medicine, and even of the use of the hot bath, and other hot applications. The longer a patient has been ill of cholera, the more carefully ought all means of relief to be applied.

Another means of relief which none can safely determine upon except a medical man, is

the employment of *calomel.* There is no medicine of more value than this, in innumerable cases of disease; no medicine of which the name is more familiar to all; and no medicine which has been so much and so mischievously abused. Considering its great use in the hands of physicians, and its great abuse in the hands of mothers and nurses, and charitable ladies, it is difficult to say whether it has saved or destroyed the greater number of lives. Calomel is obtained by subjecting mercury (quicksilver) to a chemical process, with sulphuric (vitriolic) acid, muriate of soda (common salt), and muriate of ammonia. The quicksilver employed in this country chiefly comes from Germany, but there are mines of it in Spain, in Siberia, in China, in Peru, and some other parts of the world. It is commonly employed in medicine in the form of calomel; although another preparation, much more dangerous in unskilful hands, is used also, which is called the *corrosive sublimate.* Calomel is given in doses exceedingly various, according to the very various intentions with which it is prescribed. The common dose for a grown-up person is from two to five or ten grains, in which quantities it is frequently given as a purgative, with rhubarb, or jalap, or scammony, or coloeynth.

But when calomel is given in cholera, it is given with the particular intention of acting, not as a purgative, but as a sedative. For this purpose it is given in doses of about twenty grains. Most Indian practitioners give this dose at first, even before, or, if not before, *with*

the dose of laudanum mentioned, or rather with forty or sixty drops of laudanum: and they consider the effects of it to be decidedly serviceable. It cannot be doubted that it has proved very useful; but its employment in any particular case must be left to the medical practitioner alone.

The medical adviser will also probably prefer some other stimulant to brandy. Many stimulants are used in medicine. Half a teaspoonful or a teaspoonful of ether with the laudanum is one of the best; and may indeed be safely given by any one. What is called ether is procured by distilling rectified spirit mixed with sulphuric acid. It is a medicine which requires to be repeated, and this is a matter in which the patient should act under medical direction.

Five or ten grains of the carbonate of ammonia, also, will be found one of the best medicines of the stimulant class: or twenty or thirty drops of the solution of ammonia; or of the aromatic spirit of ammonia.

In every case of violent spasm persons should be aware that inflammation *may* come on; and that if it *does* come on, the stimulants, which were useful before, become very hurtful; increasing the inflammation, and endangering life.

We have seen that when there are, after death, signs of disease in the stomach and bowels, those signs are signs of inflammatory action. The medical practitioner would detect this during life, by the excited pulse, the hotter skin, and tenderness

on pressure of the bowels. In such a violent affection as cholera the distinction is far from easy, however; but if the medical practitioner cannot make it, certainly nobody else can.

When inflammation has come on, both bleeding and the application of leeches to the pit of the stomach will be necessary. Some practitioners, who think highly of bleeding in cholera, apply leeches to the pit of the stomach and to the back of the neck in almost every case.

Both in case of inflammation, in order to subdue it; or in the simple case of violent spasm, to counteract spasm, a greater degree of stimulus may be tried over the skin of the stomach and bowels than rubbing either with or without embrocations. Blisters, for instance; but they will rise very slowly, or not at all, in the cold and languid state of the skin in cholera: for which reason some have applied nitric acid (aqua-fortis), and some have poured boiling water on the skin. These seem cruel methods. A cloth dipped in spirits of turpentine, laid upon the stomach, and kept on either till it acts decidedly on the skin, or till the patient can bear it no longer, is a better application. It is very much and very usefully employed in fevers, to check the serious disorders of the bowels which often come on. Mustard poultices are often used with the same intention—or poultices made with equal parts of mustard and linseed flour. In the examination of the bodies of some of those who have died at Sunderland, appearances of disease have been found in the spinal marrow;

and attempts have since been made to act on that part by the application of iron, heated to a white heat, to the back. This plan has been said to be very successful. The idea of having heated iron applied to the back is alarming; but when heated to a *white* heat it almost immediately destroys the life of the part, and consequently excites less pain than is imagined. The success of this treatment cannot be considered as determined.

In the opinion of the writer of these pages all the really important means of relief in cholera have now been mentioned.

A short notice of one or two other means may be added. One of these,—one, indeed, which some will think we should have mentioned before, is the *cajeput oil*. This oil is produced by the leaves of a tree which is common in the islands of Java and Borneo, (between China and New Holland). It is a powerful stimulant and antispasmodic, and also acts strongly on the skin; appearing therefore to answer many intentions at once in the cure of cholera. The common dose is three or four drops, taken on sugar: but twenty or thirty drops are given in cholera, and repeated if necessary. It has a high reputation in India; and has been lately much recommended in England. It may be taken in water, or peppermint water.

It is hardly necessary to mention Cayenne pepper, except to say that if no other stimulant is at hand, this is by no means a bad one. It is the fruit of the capsicum, a plant which grows both in the East and West Indies: the best

comes from the latter. Its dose, as a medicine, is from six grains to ten; but those who give it in cholera are not very particular about the quantity.

Bismuth has been strongly recommended. It is given in the form of the sub-nitrate of bismuth (commonly called the oxide), and is a metal found chiefly in Saxony. What is called the sub-nitrate is a solution of this metal in nitric acid, and procured (by precipitation from the solution) in the form of powder. The common dose is from three to ten grains; and it is certainly a valuable medicine in some irritable states of the stomach. At Warsaw, at St. Petersburg, and at Berlin, it was given in the cholera, in doses of three grains every two or three hours, mixed with sugar; and, it is said, with much advantage.

Magnesia has also been given in India, by some practitioners, in milk: and we have heard of its employment in England in combination with pepper. Its dose is from ten grains to half a drachm: and it may be given in milk.

Electricity and galvanism have been recommended, but not often employed, nor with very striking effects. They are used with the intention of rousing the nervous energy, and restoring the action of the heart.

Those who remember the description of the cholera in Chapter II. of this volume, may recollect that after the violence of the disorder is abated, a kind of fever comes on, which, in Europeans exposed to the climate and accustomed to the habits of India was often attended

by inflammation or by great disorder of the brain, liver, or other organs. This is not uncommon in all cases of disease, or even after accidents of different kinds, wherein the powers of life have been excessively depressed. It is a state called *re-action*. When a man is taken out of a river apparently dead, and is by warmth and proper means restored to life, this re-action first shows itself in considerable pain and distress, so that the recovered man reproaches those who have saved his life with having inflicted such torture upon him. To this state inflammation and fever sometimes succeed. So also, if a man is thrown violently from the top of a coach, he is taken up speechless and insensible: after a while he recovers his senses, and his pulse, which had ceased to beat, can be felt again: then comes on re-action, often violent re-action, so that the man must be bled to prevent inflammation of the brain.

Against this re-action in *cholera* the medical practitioner will very carefully guard; and, watching it, check its progress by bleeding, or by leeches, or by purgatives, or by all employed at the same time. But the patient must *also* guard against this re-action: for having been till now distressed by vomiting and pain; cold and listless; hovering between life and death; and unable to take any kind of nourishment; he is very likely, when relieved from such urgent distress, to become unmanageable, and to wish to eat and drink what he has a fancy for, and to have no more to do with medicine. He must still be obedient to his doctor. It often, perhaps

always, happens at this period, that purgative medicines are required to bring away offensive collections from the bowels; the remaining of which might either bring on a relapse, or prolong and aggravate the feverish symptoms. With common care such mischief will probably be averted in this country. Bleeding will seldom be required: a few doses of calomel and rhubarb; or one or two table-spoonfuls of castor-oil in peppermint-water, with ten or fifteen drops of laudanum, will commonly be sufficient.

Any person, however unacquainted with medicine, must see from these remarks on its treatment, that a great deal depends in every case on the attendants on the sick person. If the disease is concealed for a day or two—nay, often, if it goes on unchecked for an hour or two—the hope of good being done by *any* body is very small. If the friends and neighbours desert the sick, all the sick will die. It was said in India, that *none* were known to get well who did not take medicine, and were not otherwise attended to; and in Persia the people have learnt so well the dangerous character of cholera that if a man is attacked, even in the streets, the people run up to him, strip off all his clothes in a moment, pour buckets of *cold* water over him, and then rub him from head to foot as hard as possible, until the heat of the skin returns, or the spasms subside.

Even in this fatal disease, then, the ingenuity and activity of man can apply resources which render it comparatively harmless. In crowded and dirty cities, in wretched houses, the abode

of idleness and vice; or in countries where ignorance and obstinacy prevent the proper application of medicine, it rages almost without control; indeed, with a violence which threatens to sweep all the people who live in such unfortunate circumstances away from the earth. But when it is introduced into towns better regulated; and into houses where it meets with cleanliness and sobriety; and among a people willing to apply whatever science has discovered to be useful, and to aid such application by kind and courageous attentions; there the disease seems to have lost its ferocious character. The people no longer fly from it to die on the highways and in the desert; it no longer daily consigns hundreds to death; it neither suspends the business nor ruins the confidence of the people; but, being met with fortitude and patience, seems to acknowledge man's power over it, as over the other evils and ills to which he is exposed. It is checked by his skill and his firmness; limited by his knowledge and his care; and we may add, great as its triumphs have been, and wide as has been its course, it will finally be banished from the well-governed regions of the earth altogether. First it will disappear from those which it has most recently attacked;—and in the end, as the blessings of civilization extend themselves to every region on which the rain from heaven falls, or the sun of heaven shines; and as man improves in knowledge, and virtue, and power, and by degrees converts vast spaces now neglected into spots of fertility and happiness, and is himself

raised in the scale of creation,—not the cholera only, but all the most severe febrile diseases, will probably be utterly banished from this globe.

The steps to this end, however, let the reader of the Working Man's Companion remember, are, *useful knowledge*, the kind and friendly virtues, temperate habits, and a calm and untroubled mind.

POSTSCRIPT

THE progress of the cholera in the north of England, whilst these pages have been printing, affords a useful lesson to the people of those parts of the United Kingdom which have not yet been visited by it; and the lesson ought not to be thrown away. When it first appeared, as it did not attack many thousands of people at once, the fear of it greatly diminished. Many continued to deny that the true cholera had come to England. It was said that at this time of the year there was always great sickness at Sunderland; and that the deaths were not more numerous this year than in other years. This kind of belief prevailed for two months, although the cholera was all that time steadily destroying *one in three* of those attacked. In the very worst descriptions of fever in England the mortality is seldom so great as one in *ten* of those attacked; it is more commonly about one in fifteen; and in favourable circumstances not perhaps more than one in *twenty*. Yet, until within the last week, the observation was continually repeated, that the cholera did not seem to be *so very* serious a disease after all!

But about Christmas day the cholera showed itself in its old and dreadful character in every respect, at Gateshead, a town lying on the south bank of the river Tyne; Newcastle being on the north bank, exactly opposite to it. It is said that the people had *kept Christmas* with very great intemperance; and that drinking had been much indulged in. In *three* days one hundred and forty people were attacked with spasmodic cholera, and of these, more than fifty died. Still destroying, therefore, one in three, it attacked more than three times as many persons in each of these three days as it had generally done in any one day at Sunderland. What has been the consequence? —we hear that the people of Gateshead are "completely panic-stricken;" that the patients have been too numerous to obtain proper medical aid; and the deaths so many that it has been difficult to provide decent burial for the dead.

It is now beyond all dispute that the true cholera is likely to prevail in *every part* of England. But its progress is *slow*. It may be some months before it reaches the midland countries: it may be a year before it travels to the south of England. Or it may pass round the coast from sea-port to sea-port, and penetrate the interior of Great Britain at a later period. It will also, most probably, pass over to Ireland, where the poor are but too well prepared to fall victims to it. The same Great Power which permitted its origin, may arrest its progress; but there is every reason to expect that the

pestilence will pass slowly over every portion of the British Isles.

When the present fear has again somewhat subsided, which in a few weeks it probably will do, many will be disposed to think the danger is over; and to neglect temperance, cleanliness, and all those means which have been recommended as the best preservatives: but it will be well to keep in mind that between the 20th of October and the 28th of December, more than *one thousand persons* have had the spasmodic cholera in England, and that nearly four hundred have died of it.

January 8th, 1832.

APPENDIX.

THE heat of different climates having been frequently alluded to in the preceding pages, and expressed in the degrees according to Fahrenheit's thermometer, it should be explained that the heat or coldness of the air is measured by this instrument in consequence of the mercury expanding as its temperature is raised, and contracting when cooled. A small bulb at the bottom of the thermometer is full of mercury: when the bulb is made warm the mercury rises up the tube of the thermometer, and higher and higher as the heat becomes greater. At the sides of the tube are figures corresponding to lines, which lines mark degrees. The heat at which water boils, according to this thermometer, is 212 degrees; that is to say, when the bulb is exposed to the heat of boiling water, the mercury rises to a certain height in the tube, and this height is divided into 212 equal parts. If the bulb is put into ice, the mercury falls as low as the 32nd mark; therefore, according to the thermometer of Fahrenheit, the freezing point is 32, and the boiling point 212. When thermometers are made, both these points are tried; and the space between is divided into 180 exact

degrees. In temperate weather in England the mercury in the thermometer placed in the shade, in the open air, would rise to about 48 degrees. In warm weather, it rises to about 65. A room is of a comfortable warmth when mercury rises to the 55th degree. When the mercury rises to the 76th degree in the shade, butter begins to melt; when it rises to 80, the weather is what we call very hot, although it is very often ten, or fifteen, or even twenty degrees, higher in India. The ordinary temperature of the human body is a little more than 90 degrees, as shown by placing the bulb of the thermometer under the tongue, or even holding it a few minutes in the closed hand. In some fevers it rises to 100 or 104. The lowest point in our thermometer is called *zero;* but there are degrees of coldness lower than this instrument indicates; and which are indicated by other kinds of thermometers. We then say the cold is so many degrees *below zero;* which it often is in a Russian winter. At forty degrees below zero, the mercury becomes solid. Degrees are commonly thus written,—one hundred degrees of Fahrenheit—100° *Fah*r.

In perusing this work, the reader who has the opportunity should refer to the *Globe*, and remark the situation of the *Equator*, or equinoctial line, and also the lines called the *Tropics*. He will see that the globe is divided into degrees, marked by lines across it, and down it. The lines

across it show the degrees of *latitude*, of which there are 90 north of the equator, and 90 south of it. These have been repeatedly mentioned. The Mauritius will be found 20 degrees *south* of the equator, or in 20 degrees south latitude. Ceylon 10 degrees north of the equator. Calcutta about 22. Astracan 46. Moscow 55. Archangel 64, &c. London is about 57 degrees north of the equinoctial line. Each degree is equal to $69\frac{1}{2}$ miles.

The space within a line drawn about 23 degrees north of the equator, and another line 23 degrees south of it, is what is meant by the *Tropics*. In the earth's course round the sun, the sun is always *directly* over some part of the earth within those lines : it is over the line north of the equator in the middle of our summer : over the line south of it in the middle of our winter : and exactly over the equinoctial line twice a year, at what we call the equinoxes. The Tropics, therefore, are the hottest parts of the earth.

THE END.

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